SAMSUNG

User Manual

High Definition Digital Camcorder

www.samsung.com/register

HMX-U20BN
HMX-U20RN
HMX-U20LN
HMX-U20SN

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before reading this user manual

SAFETY WARNINGS

What the icons and signs in this user manual mean;

WARNING	Means that there is a potential risk of death or serious injury.
CAUTION	Means that there is a potential risk of personal injury or damage to the product.
CAUTION	To reduce the risk of fire, explosion, electric shock, or personal injury when using your camcorder, follow these basic safety precautions.
	Means hints or referential pages that may be helpful when operating the camcorder.
PRECHECK	Settings required before using a function.

These warning signs are here to prevent injury to you and others.
Please follow them explicitly. After reading this section, keep it in a safe place for future reference.

PRECAUTIONS

Warning!

- When using the AC power adapter with your camcorder, connect the adapter to an outlet with protective grounding.
- Do not expose the camcorder battery to direct sunlight, heaters, radiators, fire, or any other source of excessive heat.

Caution

If you replace the battery with the wrong battery, you can cause an explosion.
Replace only with the same battery or an equivalent type.

If you plug the AC adapter into a 240V AC outlet, be sure to use a suitable plug adapter.

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IMPORTANT INFORMATION ON USE

About this user manual

Thank you for purchasing this Samsung Camcorder. Please read this user manual carefully before you use the camcorder and keep it handy for future reference. Should your camcorder fail to operate correctly, refer to Troubleshooting.

This User Manual covers HMX-U20BN, HMX-U20RN, HMX-U20LN, HMX-U20SN models.

- Illustrations of model HMX-U20BN are used in this user manual.
- The displays in this user manual may not be exactly the same as those you see on the LCD screen.
- Designs and specifications of the camcorder and other accessories are subject to change without any notice.
- In this user manual, the icon or symbol in the parenthesis appearing in a description of a submenu item indicates it will appear on the screen when setting the corresponding item.
  Ex) Submenu item of "**Video Resolution**" ➥page 41
  - "**1080/30p**" (1080 30P HD): Records in the HD (1920x1080 30p) format. [If set, corresponding icon (1080 30P HD) appears on the screen.]

The following terms are used in this manual:

- 'Scene' refers to the point where you press the **Record Start/Stop** button to start recording until you press again to pause the recording.
- The terms 'photo' and 'still image' are used interchangeably with the same meaning.

Before using this camcorder

- **This camcorder records video in H.264 (MPEG4 part10/AVC) format and in High Definition Video (HD-VIDEO) or Standard Definition Video (SD-VIDEO).**
- **Please note that this camcorder is not compatible with other digital video formats.**
- **Before recording important video, make a trial recording.**
  Play back your trial recording to make sure the video and audio have been recorded properly.
- **We can not compensate you for damage to or loss of your recorded contents:**
  - Samsung cannot compensate for any damage caused when a recording cannot be played back because of a defect in the camcorder or memory card.
    Samsung cannot be responsible for your recorded video and audio.
  - Recorded contents may be lost due to a mistake when handling this camcorder or memory card, etc.
    Samsung shall not be responsible for compensation for damages due to the loss of recorded contents.
- **Make a backup of important recorded data.**
  Protect your important recorded data by copying the files to a PC. We also recommend you to copy it from your PC to other recording media for storage.
  Refer to the software installation and USB connection guide.

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- **Copyrights: Please note that this camcorder is intended for individual use only.**
  Data recorded on the storage media in this camcorder using other digital/analog media or devices is protected by the copyright act and cannot be used without permission of the owner of the copyright, except for personal enjoyment. Even if you record an event such as a show, performance or exhibition for personal enjoyment, it is strongly recommended that you obtain permission beforehand.
- For Open Source License information, refer to the "OpenSource-U20.pdf" in the provided CD-ROM.

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important safety instructions

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol indicates that dangerous voltage consisting a risk of electric shock is present within this unit.

This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

Warning
To Reduce The Risk Of Fire Or Electric Shock, Do Not Expose This Apparatus To Rain Or Moisture.

Caution
Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
To disconnect the apparatus from the mains, the plug must be pulled out from the mains socket, therefore the mains plug shall be readily operable.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachment/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

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15. Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

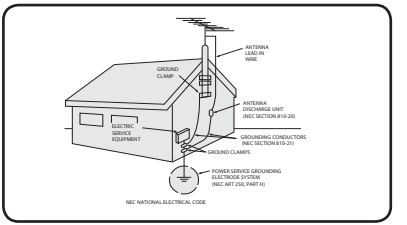
16. VENTILATION:
Slots and openings in the cabinet are provided for ventilation to ensure reliable operation of the CAMCORDER and to protect it from overheating. These openings must not be blocked or covered. Never place your CAMCORDER on a bed, sofa, rug, or other similar surface: on or near a radiator or heat register. This CAMCORDER should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

17. POWER SOURCES:
The CAMCORDER should be operated only from the type of power source indicated on the label. If you are not sure of the type of power supply at your home, consult your appliance dealer or local power company. A CAMCORDER is intended to be operated from battery power, or other sources, refer to the operating instructions.

18. GROUNDING OR POLARIZATION:
This CAMCORDER may be equipped with either a polarized 2-wire AC line plug (a plug having one blade wider than the other) or a 3-wire grounding type plug, a plug having a third (grounding) pin. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to replace your outlet. Do not defeat the safety purpose of the polarized plug.

19. POWER-CORD PROTECTION:
Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords or plugs, convenient receptacles, and the point where they exit from the unit.

20. OUTDOOR ANTENNA GROUNDING:
CAMCORDER, be sure the antenna or cable system is grounded to provide some protection against voltage surges and built-up static charges, Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire and supporting structure, grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding to conductors, location of antenna-discharge unit, connection to grounding electrodes and requirements for the grounding electrode. See figure below.


ANTENNA LEAD IN WIRE
GROUND CLAMP
ANTENNA DISCHARGE UNIT (NEC SECTION 810-20)
ELECTRIC SERVICE EQUIPMENT
GROUNDING CONDUCTORS (NEC SECTION 810-21)
GROUND CLAMPS
POWER SERVICE GROUNDING ELECTRODE SYSTEM (NEC ART 250, PART H)
NEC NATIONAL ELECTRICAL CODE

21. LIGHTNING:
For added protection of this CAMCORDER during a lightning storm or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the CAMCORDER due to lightning and powerline surges.

22. POWER LINES:
An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

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23. OVERLOADING:
Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.

24. OBJECTS AND LIQUIDS:
Never push objects of any kind into this CAMCORDER through openings as they may touch dangerous voltage points or short out a part that could result in a fire or electric shock. Never spill liquids of any kind onto the CAMCORDER. Should spillage occur, unplug unit and have it checked by a technician before use.

25. SERVICING:
Do not attempt to service this CAMCORDER yourself. Opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

26. DAMAGE REQUIRING SERVICE:
Unplug this CAMCORDER from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- **a.** When the power-supply cord or plug is damaged.
- **b.** If any liquid has been spilled onto, or objects have fallen into the CAMCORDER.
- **c.** If the CAMCORDER has been exposed to rain or water.
- **d.** If the CAMCORDER does not operate normally by following the operating instructions, adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the CAMCORDER to its normal operation.
- **e.** If the CAMCORDER has been dropped or the cabinet has been damaged.
- **f.** When the CAMCORDER exhibits a distinct change in performance, this indicates a need for service.

27. REPLACEMENT PARTS:
When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer and having the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

28. SAFETY CHECK:
Upon completion of any service or repairs to this CAMCORDER, ask the service technician to perform safety checks to determine that the CAMCORDER is in safe operating order.

29. To prevent damage which may result in fire or shock hazard, do not expose this appliance to rain or moisture.

30. If this power supply is used at 240V ac, a suitable plug adaptor should be used.

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USER INSTALLER CAUTION:
Your authority to operate this FCC certified equipment could be voided if you make changes or modifications not expressly approved by this party responsible for compliance to part 15 FCC rules.

NOTE:

Hg LAMP(S) INSIDE THIS PRODUCT CONTAIN MERCURY AND MUST BE RECYCLED OR DISPOSED OF ACCORDING TO LOCAL, STATE OR FEDERAL LAWS. For details see lamprecycle.org, eiae.org, or call 1-800-Samsung (7267864)

CALIFORNIA USA ONLY
This Perchlorate warning applies only to primary CR (Manganese Dioxide) Lithium coin cells in the product sold or distributed ONLY in California USA
" Perchlorate Material - special handling may apply, See www.dtsc.ca.gov/hazardouswaste/perchlorate."

NOTE:
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help and for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This Booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 004-000-00345-4.

FCC Warning
The user is cautioned that changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.
This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions;

(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

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safety information

The safety precautions illustrated below are to prevent personal injury or material damages. Heed all instructions carefully.

WARNING
Means that there is a potential risk of serious personal injury.

CAUTION
Means that there is a potential risk of personal injury or damage to the product

Prohibited action.

Do not disassemble the product.

Unplug from the power supply.

Do not touch the product.

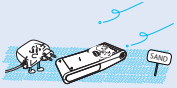
This precaution must be kept.

⚠ WARNING

Do not overload outlets or extension cords as this may result in abnormal heat or fire.

Using the camcorder at temperatures over 60℃(140℉) may result in fire. Keeping the battery at a high temperature may cause an explosion.

Do not allow water or metal and inflammable matter to enter the camcorder or AC power adaptor. Doing so may pose a fire hazard.

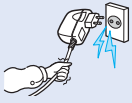


No sand or dust! Fine sand or dust entering the camcorder or AC power adaptor could cause malfunctions or defects.

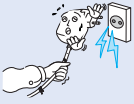
No oil! Oil entering the camcorder or AC power adaptor could cause electric shock, malfunctions or defects.

Do not aim the camcorder directly into the sun. Doing so could cause eye injuries, as well as lead to malfunctioning of internal parts of the product.

Do not bend the powercord or damage the AC power adaptor by pressing on it with a heavy object. There may be a risk of fire or electric shock.



Do not disconnect the AC adaptor by pulling on its power-cord, as this could damage the power-cord.



Do not use the AC adaptor if it has damaged, split or broken cords or wires. Doing so may cause fire or electric shock.

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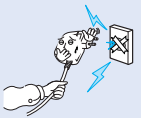
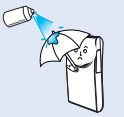
safety information



Do not connect the AC adaptor unless the plug can be fully inserted with no part of the blades exposed.

Do not dispose of battery in a fire as it may explode.



Never use cleaning fluid or similar chemicals. Do not spray cleaners directly on the camcorder.

Keep the camcorder away from water when used near the beach or pool or when it rains. There is a risk of malfunction or electric shock.

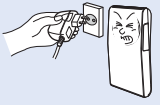
Keep the used lithium battery or memory card out of the reach of children. If the lithium battery or memory card is swallowed by children, consult physician immediately.

Do not plug or unplug the power cord with wet hands. There is a risk of electric shock.

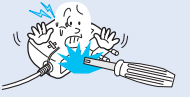
Keep the power-cord unplugged when not in use or during lightning storms. There is a risk of fire.

When cleaning the AC adaptor, unplug the power-cord. There is a risk of malfunction or electric shock.

If the camcorder makes an abnormal sound, or smell or smokes, unplug the power-cord immediately and request service from a Samsung service center. There is a risk of fire or personal injury.



If the camcorder malfunctions, immediately detach the AC adaptor or battery from the camcorder. There is a risk of fire or injury.



Do not attempt to disassemble, repair, or modify the camcorder or the AC adaptor to avoid a risk of fire or electric shock.

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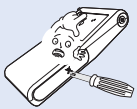
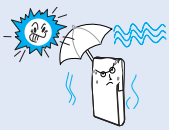
CAUTION



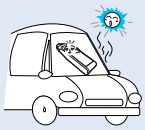
Do not press the surface of the LCD with force, or hit it with a sharp object. If you push the LCD surface, display unevenness may occur.

Do not drop or expose the camcorder, battery, AC adaptor or other accessories to severe vibrations or impact. This may cause a malfunction or injury.

Do not use the camcorder on a tripod (not supplied) in a place where it is subject to severe vibrations or impact.



Do not use the camcorder in direct sunlight or near heating equipment. The heat may cause a malfunction or injury.



Do not leave the camcorder in a closed vehicle for a long time, where the temperature is very high.

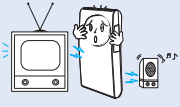
Do not expose the camcorder to soot or steam. Thick soot or steam could damage the camcorder case or cause a malfunction.

Do not use the camcorder near dense exhaust gas generated by gasoline or diesel engines, or corrosive gas such as hydrogen sulphide. Doing so may corrode the external or internal terminals, disabling normal operation.

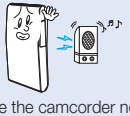
Do not expose the camcorder to insecticide. Insecticide entering the camcorder could cause the product to operate abnormally. Turn the camcorder off and cover it with vinyl sheet, etc. before using insecticide.

Do not expose the camcorder to sudden changes in temperature or a humid place. There is also a risk of defect or electric shock when using outdoors during lightning storms.

Do not wipe the camcorder body with benzene or thinner. The exterior coating could peel off or the case surface could deteriorate.



Do not use the camcorder near a TV or radio: It can cause noise on the TV screen or the radio.



Do not use the camcorder near sources of strong radio waves or magnetism such as speakers or large motors. Noise from these sources could distort the video or audio you are recording.

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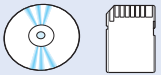
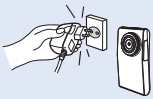
safety information

Use Samsung-approved accessories only. Using products from other manufacturers may cause overheating, fire, explosion, electric shock or personal injuries caused by abnormal operation.

Place the camcorder on a stable surface that is well ventilated.



Keep important data separately. Samsung is not responsible for data loss.



Only use the adaptor plug in a socket that is easily accessible. If any problem occurs with the product, you must pull the plug out of the socket to disconnect the power completely. Turning off the power button on the product does not completely disconnect the power.

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quick start guide

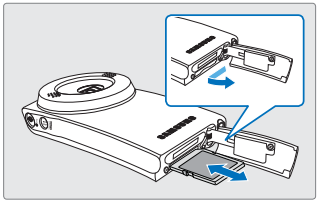
This quick start guide introduces the basic operation and features of your camcorder. See the reference pages for more information.

You can record videos in H.264 format!

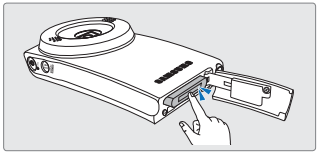
You can record videos in the H.264 format that are convenient to email and share with your friends and family. You can also take photos with your camcorder.

STEP1: Get ready

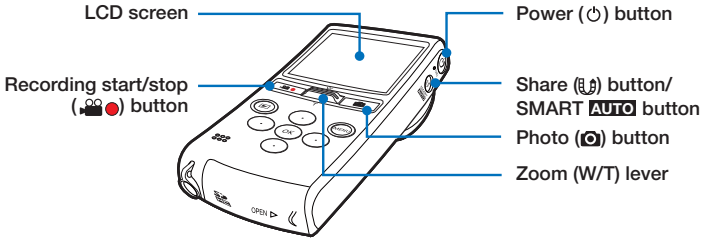
1. Insert a memory card.
   - You can use commercially available SDHC (SD High Capacity) or SD memory cards with this camcorder.



2. Insert the battery into the battery slot.
3. Charge the battery fully. ➥page 16
   - The battery is fully charged when the CHG (charging) indicator light turns green.



STEP2: Record with your camcorder



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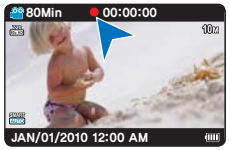
Recording videos with HD (high definition) image quality

Your camcorder uses advanced H.264 compression technology to realize the clearest video quality.

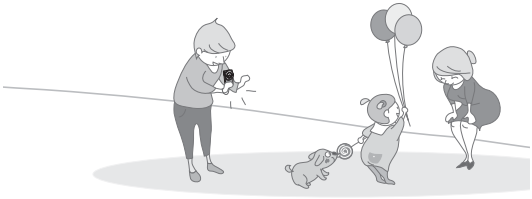
1. Press the **Power** (⏻) button.
2. Press the **Recording start/stop** (🎥●) button.
   - To stop recording, press the **Recording start/stop** (🎥●) button.



Recording photos

Your camcorder can record a high quality photo with a 4:3 or 16:9 aspect ratio.

1. Press the **Power** (⏻) button.
2. Press the **Photo** (📷) button halfway down to check the target image.
3. Press the **Photo** (📷) button fully when you are ready.



- Your camcorder is compatible with the H.264 recording format, which achieves efficient coding of high quality video using less memory capacity.
- The default setting is "**720/60p**". You can also record with SD (standard definition) video quality. ➥page 41
- You can take photos while you are recording videos. ➥page 33

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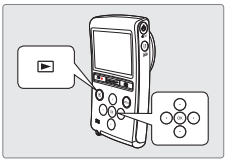
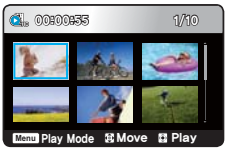
STEP3: Play back videos or photos

Viewing the LCD screen of your camcorder

You can find your desired recordings quickly by using the thumbnail index view.



1. Press the **Play** (▶) button to select the play mode.
2. In Play Mode, select "**HD Video**," "**SD Video**," or "**Photo**." ➥page 45
   - The recorded videos or photos appear in the thumbnail index view.
   - The thumbnail of the latest created or played file is highlighted.
3. Press the ▲/▼/◀/▶ button to select the desired video or photo, then press the **OK** button.



- You can set the Play Mode in thumbnail view only.
- You can switch from the play mode to the record mode by pressing the **Recording start/stop** (●), **Photo** (📷), or **Play** (▶) button.

Viewing on a high definition TV

You can enjoy HD (High Definition) videos on a connected HDTV. ➥page 68

STEP4: Save recorded videos or photos

Simple and fun! Enjoy the various features of Intelli-studio on your Windows computer.

Using the Intelli-studio program built into your camcorder, you can import videos/photos into your computer and edit or share the videos/photos with your friends. ➥pages 60~64

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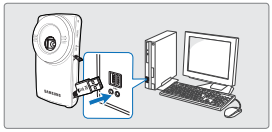
Importing and viewing videos/photos from the camcorder to your PC

1. Start the Intelli-studio program by connecting the built-in USB jack of the camcorder to the PC.
   - A new file saving screen appears with the Intelli-studio main window.
     Click "**Yes**". The uploading procedure starts.
2. Any new files are saved to your PC and registered to "**Contents Manager**" in the Intelli-studio program.
   - You can arrange the files by different options such as Face, Date, Location, etc.
3. You can double-click the file you would like to start playing.



Sharing videos/photos on Youtube/Flickr/FaceBook

Share your contents with the world, by uploading videos and photos directly to a web site with a single click.
Click the "**Share**" → "**Upload**" tab on the browser. ➥page 63

The Intelli-studio runs automatically after you've connected your camcorder to a Windows computer (if you have set "**PC Software: On**"). ➥ page 56

STEP5: Delete videos or photos

If the camcorder's storage media is full, you cannot record new videos or photos. Delete videos or photos you've saved on your computer from the camcorder's storage media. Then you can record new videos or photos in the newly freed-up space.

Press the Play (▶) button to switch the play mode → press the MENU button → press the ▲/▼/◀/▶/OK button to select "Delete." ➥page 46

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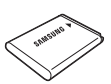
WHAT'S INCLUDED WITH YOUR CAMCORDER

Your new camcorder comes with the following accessories. If any of these items is missing from your box, call Samsung's Customer Care Center.

Model name	Color	Memory card slot	LCD screen	Lens
HMX-U20BN	Black	Yes	Color	Optical zoom: x3 (Photo only) Intelli zoom: x3.6 (Video only)
HMX-U20RN	Pink Red			
HMX-U20LN	Blue			
HMX-U20SN	Silver			

- The shape is the same for all models. Only the color is different.

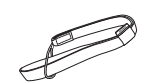
Checking your accessories



Battery (IA-BH130LB) (AD43-00190A)

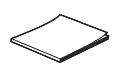
AC power adaptor (AA-MA9 type) (AD44-00151A)

Audio/Video cable (AD82-00689A)



Wrist strap (AD63-04924A)

User manual CD (AD82-00680A)



Quick start guide (AD82-00682A)

Optional accessories

Mini HDMI cable
(AD39-00159A)

- The contents may vary depending on the sales region.
- Parts and accessories can be purchased after consulting with your local Samsung dealer. SAMSUNG is not responsible for reduced built-in battery life time or malfunctions caused by any unauthorized use of accessories such as the AC power adaptor.
- A memory card is not included. See page 26 for memory cards compatible with your camcorder.
- Your camcorder includes the user manual CD and printed quick start guide.

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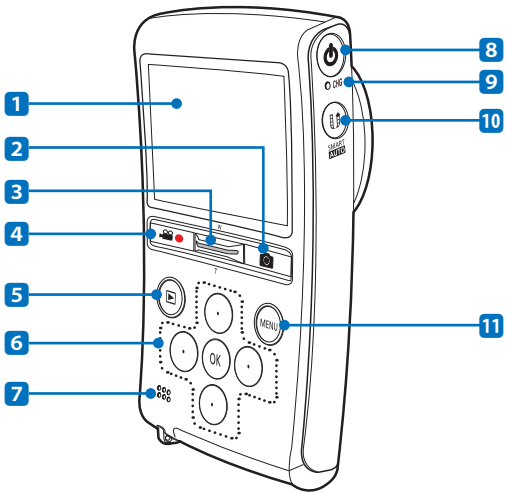
LOCATION OF CONTROLS

Front & Right side



1	LCD screen
2	Photo (📷) button
3	Zoom (W/T) lever
4	Recording start/stop (🎥●) button
5	Play (▶) button
6	▲/▼/◀/▶/OK button
7	Built-in speaker
8	Power (⏻) button
9	CHG (Charging) indicator
10	Share (🤳) button / SMART AUTO button
11	MENU button

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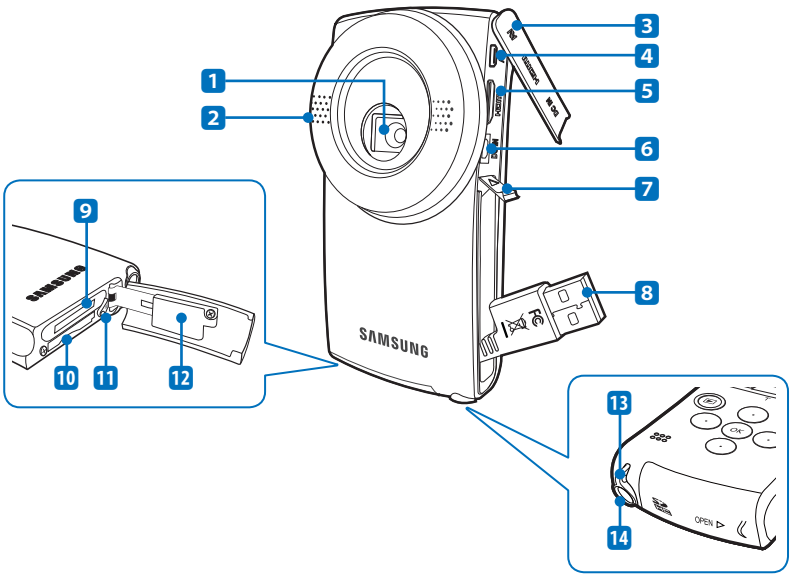
Rear/Left/Bottom side



1	Lens
2	Internal microphone
3	Jack cover (AV, HDMI, DC IN)
4	AV jack
5	HDMI jack
6	DC IN jack
7	OPEN lever
8	Built-in USB jack
9	Battery slot
10	Memory card slot
11	Battery release switch
12	Memory card / Battery cover
13	Wrist strap hook
14	Tripod receptacle

Be careful not to cover the internal microphone and lens during recording.

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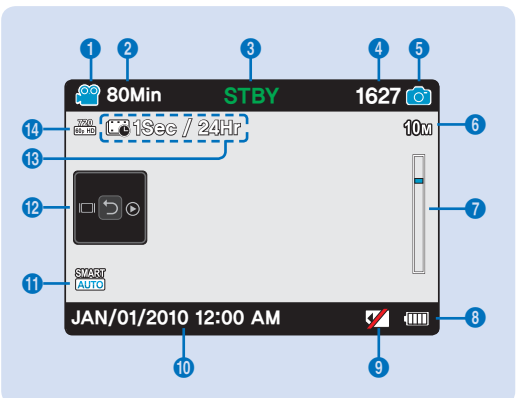
IDENTIFYING THE SCREEN DISPLAYS

The available functions vary depending on the operation mode you've selected, and different indicators appear depending on the setting values.

PRECHECK!

- This On Screen Display (OSD) is shown in the record (🎥 📷) mode only.
- Select the record mode by pressing the **Play** (▶) button. ➥page 20

Record mode



1 Video record mode
2 Remaining recordable time
3 Operating mode (**STBY** (Standby) / ● (Recording))
4 Photo counter (total number of recordable photos)
5 Photo record mode
6 Photo resolution
7 Optical zoom
8 Battery information (remaining battery level)
9 Warning indicators
10 Date/Time display
11 Smart Auto mode
12 Shortcut menu (OK Guide)
   ▭: Display
   ▶ : Quick view
   ⮌ : Shortcut menu selection / Return
13 Time Lapse REC *
14 Video resolution

- Settings of functions marked with * are not retained when the camcorder is turned off.
- The on-screen indicators are based on an 8GB SDHC memory card.
- The screen above is an example and may differ from the actual display.
- For enhanced performance, the display indications and the order are subject to change without prior notice.
- This camcorder provides one combined video and photo record mode. You can easily record videos or photos in the same mode without having to change it.
- The total number of recordable photos is counted based on available space on the storage media.
- The largest number the photo counter can display is 9999.
- You can check the selected mode indicator only when the on-screen information mode is set to full display. ➥page 21

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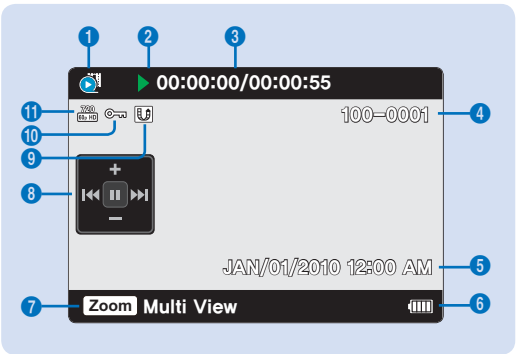
PRECHECK!

- This On Screen Display (OSD) is shown in video play (/) mode only.
- Select the play mode by pressing the **Play** ( ) button. ➥page 20

Video play mode

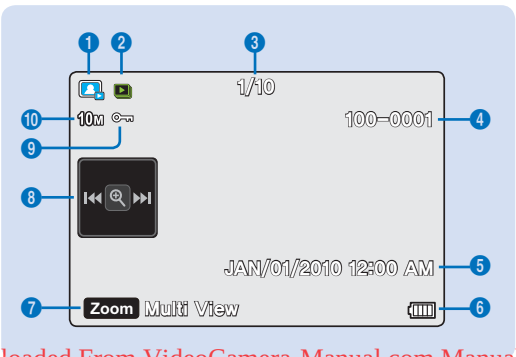


1 Video play mode
2 Operating status (Play / Pause)
3 Time code (elapsed time/recorded time)
4 File name (file number)
5 Recorded date/time display
6 Battery information (remaining battery level)
7 Button guide
8 Shortcut menu (OK Guide)
  / : Move to previous file / REW (rewind)
  / : Move to next file / FF (fast forward)
  / : Volume up/volume down
  / : Play/pause
9 Share mark
10 Protection
11 Video resolution

PRECHECK!

- This On Screen Display (OSD) is shown in photo play ( ) mode only.
- Select the play mode by pressing the **Play** ( ) button. ➥page 20

Photo play mode



1 Photo play mode
2 Slide show
3 Image counter (current image/total number of recorded images)
4 File name (file number)
5 Recorded date/time display
6 Battery information (remaining battery level)
7 Button guide
8 Shortcut menu (OK Guide)
  / : Previous/next photo
  : Playback zoom
9 Protection
10 Photo resolution

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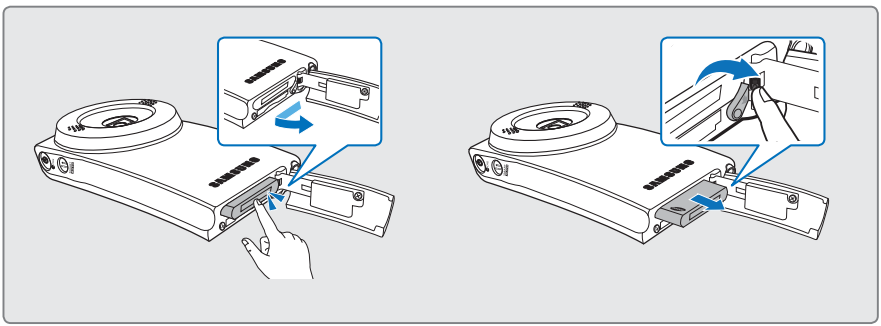
USING THE BATTERY

Purchase extra batteries to allow continuous use of your camcorder.



Inserting the battery

1. Open the battery cover by sliding the **OPEN** lever as shown in the figure.
2. Insert the battery into the battery slot until it locks.
   - Make sure that the SAMSUNG logo is facing up while the battery is placed as shown in the figure.
3. Close the battery slot cover.

Ejecting the battery

1. Open the battery cover by sliding the **OPEN** lever as shown in the figure.
2. Slide the **Battery release** switch and pull out the battery.
3. Close the battery cover.

- Use only Samsung-approved batteries. If you use batteries from other manufacturers, there is a danger of overheating, fire or explosion.
- Samsung is not responsible for problems caused by unapproved batteries.

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Charging the battery

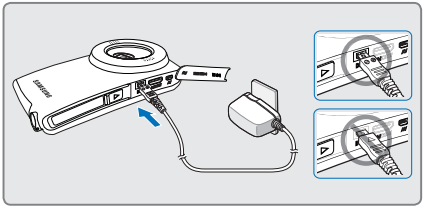
PRECHECK!

- Be sure to charge the battery before you start using your camcorder.
- Use the AC adaptor supplied with the camcorder or the built-in USB jack.

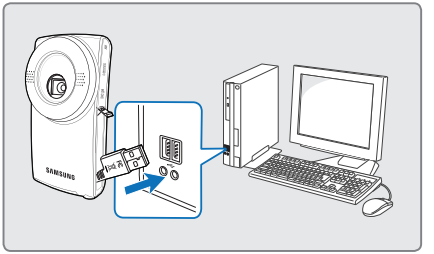
1. Press the **Power** (⏻) button to turn off the camcorder.
2. Charge the battery using the adaptor or USB.
   - The charging (CHG) indicator lights up and charging starts. After the battery is fully charged, the charging (CHG) indicator turns green. ➥page 17

Using the AC power adaptor	Connect the AC power adaptor to the camcorder properly and plug the AC Power adaptor in the wall outlet.
Using the built-in USB jack	Connect the built-in USB jack of the camcorder to the USB jack of a PC. • Use the USB cable (not supplied) according to the environment the PC is used in.

Using the AC power adaptor



Using the built-in USB jack



Please make sure that there are no foreign substances in the plug and socket when you connect the AC power supply to the camcorder.

- When charging, if both the built-in USB jack and AC power adaptor are connected, the AC power adaptor will override the USB.
- Start charging the battery after turning off the camcorder by pressing the **Power** (⏻) button.

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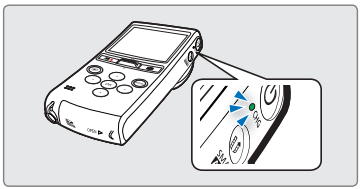
CHECKING THE BATTERY STATE

You can check the charging state and remaining battery capacity.

To check the charging state

The color of the LED indicates the power or charging state.



Charging (CHG) indicator

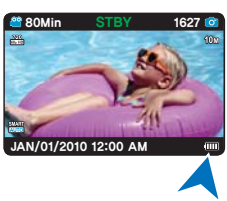
The color of the charging indicator shows the charging state.

Charging state	Charging	Fully charged	Error
LED color	(Orange)	(Green)	(Orange blink)

Battery level display

The battery level display shows the amount of battery power remaining in the battery.

Battery level indicator	State	Message
	Fully charged	-
	25~50% used	-
	50~75% used	-
	75~95% used	-
	95~98% used	-
	Exhausted (flickers): The device will soon turn off. Change the battery as soon as possible.	-
-	After 3 seconds, the camcorder turns off with the battery indicator blinking.	**"Low Battery"**



Above figures are based on a fully charged battery at normal temperature. Low ambient temperature may affect the use time.

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Available running time for the battery

Battery type		IA-BH130LB	
Charging time		180min. (AC power adaptor) / 360min. (Built-in USB jack)	
Video resolution		HD	SD
Mode	Continuous recording time	110min.	120min.
	Playback time	240min.	280min.

- Charging time: Approximate time in minutes (min.) required to fully charge a completely exhausted battery.
- Recording/Playback time: Approximate time available when you have fully charged the battery.
- The times are only for reference. Figures shown above are measured under Samsung's test environment. Your times may differ depending on your usage and conditions.
- We recommend using the AC power adaptor when using the Time Lapse REC function.

About the battery

- The battery should be recharged in an environment that is between 32°F (0°C) and 104°F (40°C). Exposure to temperatures below 32°F (0°C) reduces the battery's usage time and may cause it to stop working. If this happens, place the battery in your pocket or other warm, protected place for a short time, then re-insert it.
- Do not put the battery near any heat source (i.e. fire or a heater).
- Do not disassemble, apply pressure to, or heat the battery.
- Do not allow battery terminals to be short-circuited. This may cause leakage, generate heat, or cause a fire.

Maintaining the battery

- The recording time is affected by temperature and environmental conditions.
- We recommend using only the battery type that came with your camcorder. This battery type is available from your Samsung retailer. When the battery reaches the end of its life, please contact your local dealer. The batteries must be dealt with as chemical waste.
- Make sure that the battery is fully charged before starting to record.
- To preserve battery power, keep your camcorder turned off when you are not operating it.
- Even when the power is switched off, the battery will still discharge if it is left in the camcorder. We recommend that you remove the battery from the camcorder when not using it.
- If the battery is not used for a long time, fully charge the battery and then, using your camcorder, drain the charge completely once every 2 months to keep the battery functioning properly. To store the battery, remove it from your camcorder and put it in a cool, dry place.

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About the battery life

- Battery capacity decreases over time and through repeated use. If decreased usage time between charges becomes significant, it is probably time to replace the battery it with a new one.
- Each battery's life is affected by storage, operating, and environmental conditions.

About the running time

- Times listed were measured when using the camcorder at 77˚F (25˚C). As the environmental temperature and conditions vary, the actual battery time may differ from the approximate times given in the table.
- The recording and playback time may be shorter depending on the conditions under which you use your camcorder. For example, in actual recording, the battery may discharge 2-3 times faster than listed if you use Record start/stop and Zoom frequently, and use playback to view your recordings. Assume that the recordable time with a fully charged battery is between 1/2 and 1/3 of the time in the table, so have enough batteries to allow for the time you are planning to record on the camcorder.
- The recording and playback time will be shorter when you use your camcorder in low temperatures.

On the battery

- The charging (CHG) indicator blinks during charging, or battery Info will not be correctly displayed under the following conditions:
  - The battery is not inserted correctly.
  - The battery is damaged.
  - The battery is worn-out. (For the battery information only)

Using an AC power source

We recommend that you use the AC power adaptor to power the camcorder from a household AC outlet when you set functions, play back, or edit images, or use it indoors. Make the same connections as you do when charging the battery. ➥page 16

On the AC power adaptor

- Use a nearby wall outlet when using the AC power adaptor. Disconnect the AC power adaptor from the wall outlet immediately if any malfunction occurs while using your camcorder.
- Do not use the AC power adaptor in a narrow space, such as between a wall and furniture.
- Do not short-circuit the DC plug of the AC power adaptor or battery terminals with any metallic objects. This may cause a malfunction.
- Even if your camcorder is turned off, AC power is still supplied to it while connected to the wall outlet via the AC power adaptor.

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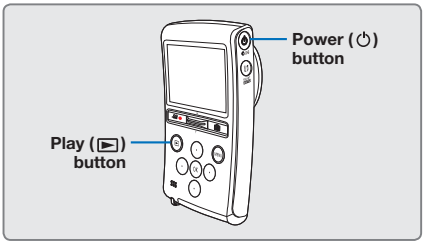
basic operation of the camcorder

This chapter introduces you to the basic operation procedures of this camcorder, such as turning the power on/off, switching modes, and setting on-screen indicators.



TURNING YOUR CAMCORDER ON/OFF

You can turn the power on or off by pressing the **Power** (⏻) button.

SETTING THE OPERATING MODES

You can switch the operating mode in the following order each time you press the **Play** (▶) button: Record mode ↔ Play mode

Mode	Functions
Record mode	To record videos or photos.
Play mode	To play videos or photos, or edit them.

- This camcorder provides one record mode for both video and photo recordings. You can easily record videos or photos in the same mode without having to switch modes.
- When the camcorder is turned on, the self-diagnosis function operates and a message may appear. In this case, refer to "Warning indicators and messages" (on pages 72, 73) and take corrective action.

When using this camcorder for the first time

When you use your camcorder for the first time or reset it, the date and time set screen appears as the startup display. Set the date and time. ➥page 23
If you do not set the date and time, the date and time set screen appears every time you turn on the camcorder.

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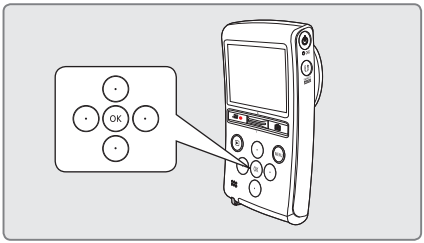
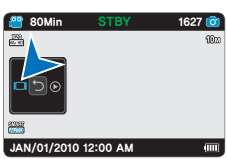
USING THE SHORTCUT MENU (OK GUIDE)

The Shortcut menu (OK guide) represents the most frequently accessed functions according to the selected mode. Pressing the **OK** button displays a shortcut menu of frequently used functions on the LCD screen.



For example: Setting Display mode in the Record mode using the Shortcut menu (OK guide)

1. Press the **OK** button in STBY mode.
   - The Shortcut menu appears.
2. Press the ◀ button to select the Display mode.
   - The Display mode (▣) icon is highlighted.
3. Each time you press the ◀ button, the following on-screen information display modes appear:
   simple display → full display → display off
   - Select the desired mode, then press the **OK** button to confirm your selection.
   - Press the **OK** button to exit the shortcut menu.



The above is an example of how to set the Display mode in the recording mode.
While many functions operate similarly, the setting process may vary, depending on the function.

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USING THE ▲/▼/◀/▶/OK BUTTON

Button	Record mode	Play mode		Menu selection
		Video play mode: Single view	Photo play mode: Single view	
OK	 • Access the shortcut menu • Confirm selection • Exit the shortcut menu	 • Access the shortcut menu • Playback / Pause	 • Access the shortcut menu • Playback / Playback zoom (x2.0 - x5.0)	Confirms selection
▲ (●)	-	Increases the volume	-	Moves the cursor up
▼ (●)	-	Decreases the volume	-	Moves the cursor down
◀ (●)	**Display** Each time you press the ◀ button, the following on-screen information display modes appear: simple display → full display → display off	• Search playback RPS (Reverse Playback Search) rate: x2→x4→x8→x16→x32 • Previous skip playback • Frame-by-frame playback	Previous image	Moves to the previous menu
▶ (●)	**Quick View** You can view the most recently recorded video or photo right after you've recorded.	• Search playback FPS (Forward Playback Search) rate: x2→x4→x8→x16→x32 • Next skip playback • Frame-by-frame playback • Forward slow motion playback rate: x1/2→x1/4→x1/8	Next image	Moves to the next menu

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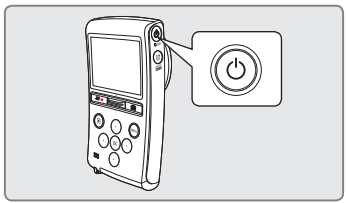
TURNING THE POWER ON AND SETTING THE DATE AND TIME

Set the date and time of your local area when you turn on the camcorder for the first time. If you do not set date and time, the date and time screen appears every time you turn on your camcorder.

1. Press the **Power** (⏻) button to turn on the camcorder.
   - When you turn on your camcorder for the first time, the Date/Time Set screen appears.
2. Set each date or time value by pressing the ▲/▼ buttons. Press the **OK** button after you set each date or time value. The cursor moves to the next value.
3. After you press the **OK** button after selecting AM or PM, the camcorder exits the Time and Date screen.



The year can be set up to 2039.

Built-in rechargeable battery

- Your camcorder includes a built-in rechargeable battery that retains the date and time settings even after the power is turned off.
- If the battery is depleted, the current date/time values are reset to the default values. You need to recharge the built-in rechargeable battery (see below), and then re-set the current date and time.

Charging the built-in rechargeable battery

- The built-in battery is always recharged while your camcorder is connected to the AC power or while the battery is inserted.
- If the camcorder is not in use for about 2 weeks without connecting to the AC power or inserting the battery, the built-in battery fully discharges. If this occurs, charge the built-in battery by connecting to the supplied AC adaptor for 24 hours.

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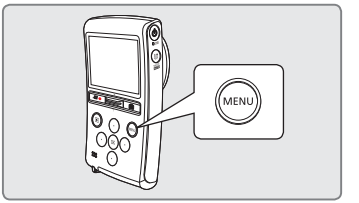
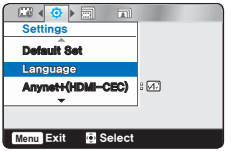
SELECTING THE OSD LANGUAGE

You can select the language in which the camcorder displays the menu screen and the messages.

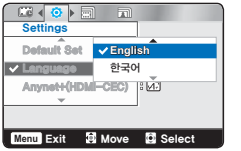
1. Press the **MENU** button.
   - The menu screen appears.
2. Press the ◀/▶ button to select "**Settings**."
   - The settings menu appears.
3. Press the ▲/▼ button to select "**Language**," and then press the **OK** button.
4. Press the ▲/▼ button to select the desired OSD language, and then press the **OK** button.
5. To exit, press the **MENU** button.
   - The OSD language is refreshed in the selected language.





Submenu items

"English" → "한국어" → "Français" → "Deutsch" →
"Italiano" → "Español" → "Português" → "Русский" →
"中文" → "ایرانی"



- "**Language**" options may be changed without prior notice.
- The camcorder retains the language you select even when not connected to the battery or AC power.
- The date and time format may change depending on the selected language.

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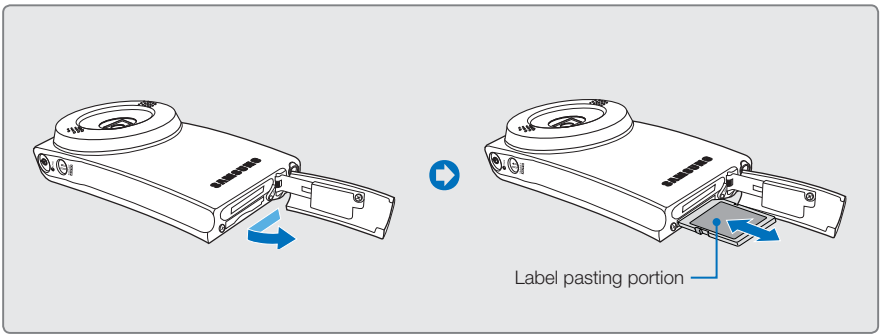
INSERTING/EJECTING A MEMORY CARD (NOT SUPPLIED)



To insert a memory card

1. Open the memory card cover by sliding the **OPEN** lever as shown in the figure.
2. Insert the memory card into the card slot until it softly clicks.
   - Make sure that the SD/SDHC card logo is facing up and the camcorder is placed as shown in the figure.
3. Close the memory card cover.

To eject a memory card

1. Open the memory card cover by sliding the **OPEN** lever as shown in the figure.
2. Gently push the memory card to eject it.
3. Close the memory card cover.

- To avoid the data loss, turn off the camcorder by pressing the **Power** (⏻) button before inserting or ejecting the memory card.
- Be careful not to push the memory card too hard. The memory card may suddenly pop out.

Your camcorder supports only SD (Secure Digital) and SDHC (Secure Digital High Capacity) cards. The compatibility with the camcorder may vary depending on the manufacturer and the type of the memory card.

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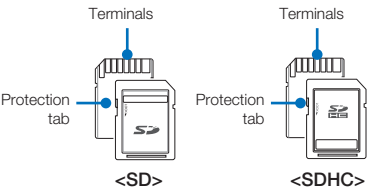
SELECTING A SUITABLE MEMORY CARD (NOT SUPPLIED)

Compatible memory cards

- This camcorder can be used with SD (Secure Digital) and SDHC (Secure Digital High Capacity) cards.
  We recommend you use an SDHC (Secure Digital High Capacity) card.
  SD cards up to 2GB are supported with this camcorder. Normal operation is not guaranteed with SD cards bigger than 2GB.
- MMC (Multi Media Card) and MMC Plus are not supported.
- Compatible memory card capacity:
  SD 1GB ~ 2GB, SDHC 4GB ~ 32GB
- Use compatible memory card brands. Others are not guaranteed to work. A list of compatible brands is below:
  - SDHC/SD cards: Panasonic, SanDisk, TOSHIBA
- For video recording, use a memory card that supports faster write speed.
  - Write speed: 5MB/sec or higher is recommended.
- SD/SDHC memory cards have a mechanical write-protection switch. Setting the switch prevents accidental erasure of files recorded on the card. To enable writing, move the switch up in the direction of the terminals.To set write protection, move the switch down.

Usable memory card (1GB~32GB)



SDHC (Secure Digital High Capacity) cards

- SDHC (Secure Digital High Capacity) memory cards
  - An SDHC card is a higher version (Ver. 2.00) of the SD card and supports capacities above 2GB.
  - SDHC cards cannot be used with current SD enabled host devices.

Common cautions for memory cards

- Damaged data may not be recovered. We recommend you make a back-up of important data separately on the hard disk of your PC.
- Turning the power off or removing a memory card during an operation such as formatting, deleting, recording, and playback may cause data loss.
- After you modify the name of a file or folder stored in the memory card using your PC, your camcorder may not recognize the modified file.

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Handling a memory card

- We recommend that you power off before inserting or removing the memory card to avoid data loss.
- We can not guarantee that you can use memory cards formatted by other devices. Be sure to format your memory card using this camcorder.
- You have to format newly-purchased memory cards, memory cards with data that your camcorder cannot recognize or with data saved by other devices. Note that formatting erases all data on the memory card.
- If you cannot use a memory card that has been used with another device, format it with your camcorder. Note that formatting erases all information on the memory card.
- A memory card has a certain life span. If you cannot record new data, you have to purchase a new memory card.
- Do not bend, drop, or cause strong impact to the card.
- Do not place foreign substances on the memory card terminals. Use a soft dry cloth to clean the terminals if required.
- Do not paste anything other than label provided with the card on the label pasting section.
- Be careful to keep the memory card out of the reach of children, who might swallow it.

Notes on use

- Samsung is not responsible for data loss due to misuse.
- We recommend using a memory card case to avoid losing data from moving and static electricity.
- After a period of use, the memory card may get warm. This is normal and is not a malfunction.

The camcorder supports SD and SDHC memory cards, giving you a wider choice of cards!

The data storage speed may differ, depending on the manufacturer and production system.

- SLC (Single Level Cell) system: faster write speed enabled.
- MLC (Multi Level Cell) system: only lower write speed is supported.

For best results, we recommend using a memory card that supports a faster write speed.

Using a lower write speed memory card for recording video may cause difficulties when storing.

You may even lose your video data during the recording.

In an attempt to preserve every bit of the recorded video, the camcorder forcibly stores the video on the memory card and displays a warning:

“Low speed card. Please record at a lower resolution.”

If you are unavoidably using a low speed memory card, the resolution and quality of the recording may be lower than the set value. ➥page 41

The higher the resolution and quality, the more memory the camcorder uses.

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RECORDABLE TIME AND CAPACITY

- The following shows the camcorder's maximum recording time and number of images according to the resolution / memory capacity.
- For recording videos and photos, please note the approximate maximum limits.

Recordable time for videos

Media	Memory Card (SDHC/SD)					
Capacity / Resolution	1GB	2GB	4GB	8GB	16GB	32GB
1080/30p	6	13	27	57	113	225
720/60p	9	18	38	80	157	313
720/30p	13	27	54	114	223	445
480/60p	17	35	70	147	288	575

(Unit: Approximate minutes of recording)

Recordable number of photos

Media	Memory Card (SDHC/SD)					
Capacity / Resolution	1GB	2GB	4GB	8GB	16GB	32GB
10M(3648x2736)	204	397	787	1627	3176	6350
8M(3264x2448)	255	499	987	2040	3983	7695
6M(3328x1872)	326	634	1255	2593	5061	9999
5M(2592x1944)	404	790	1565	3233	6310	9999
3M(2048x1536)	642	1242	2459	5080	9916	9999
2M(1920x1080)	974	1902	3765	7779	9999	9999

(Unit: Approximate number of images)

1GB ≒ 1,000,000,000 bytes : Actual formatted capacity may be less as the internal firmware uses a portion of the memory.

- Actual recording times may differ depending on the recording conditions and the subject.
- The higher the resolution settings, the more memory is used.
- High resolution images occupy more memory space than low resolution images. If the higher resolution is selected, there is less space to record videos in the memory.
- When recording complex videos with a lot of action and color, the file size will be larger.
- Memory cards of bigger than 32GB in capacity may not work properly.
- The maximum size of a video file that can be recorded at one time is 3.8GB.
- You can store up to 9999 videos and photos in one folder.
- The recording length of a Time Lapse REC may vary depending on settings.
- The camcorder takes photos at 8 mega pixels. When you set the resolution to 10M, the camcorder up-scales the photos you take to 10 mega pixels.

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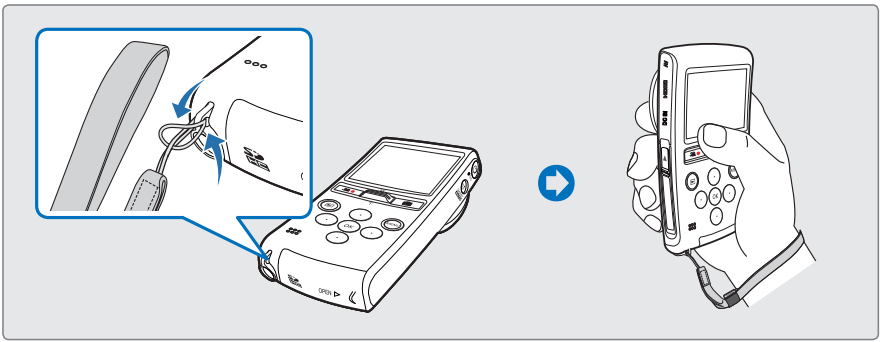
USING THE WRIST STRAP

Attach the strap and place your hand through the loop to prevent the camcorder from being dropped.



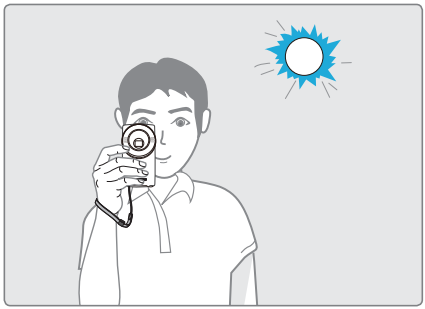
BASIC CAMCORDER POSITIONING

Hold your camcorder properly while recording to avoid covering the lens and the internal microphone with your fingers and pressing any buttons accidently.

Adjusting the shooting angle

Aim the camcorder as shown in the illustration.

1. Loop the wrist strap around your wrist.
2. Make sure your footing is stable and there is no danger of colliding with another person or object.
3. Aim and focus as shown in the illustration.



We recommend you keep the sun behind you while shooting.

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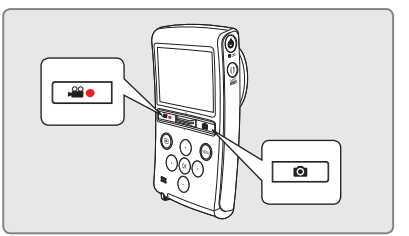
RECORDING VIDEOS OR PHOTOS

- This camcorder supports both High Definition(HD) and Standard Definition(SD) image resolutions.
- It also supports various resolutions for photos.
- Set your desired resolution before recording. ➥pages 41, 42
- This camcorder provides one record mode which combines the video and photo record modes. You can easily record videos or photos in the same mode without having to change it.

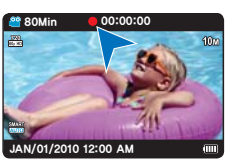
PRECHECK!

- Insert a memory card. ➥page 25
- Check the subject on the LCD screen.



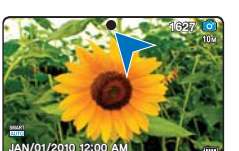
To record videos

1. Press the **Recording start/stop** (●) button.
   - The recording indicator (●) appears and recording starts.
2. To stop recording, press the **Recording start/stop** (●) button again.



To record photos

1. Press the **Photo** (📷) button halfway down (half press).
   - Check the target image.
2. Press the **Photo** (📷) button down fully (full press).
   - The camera produces a shutter sound. When the capturing (▶▶▶) indicator disappears, the photo is recorded.
   - While saving the photo on the storage media, you cannot proceed with the next recording.



If the Smart Auto is set to Off, the auto focus frame is displayed.

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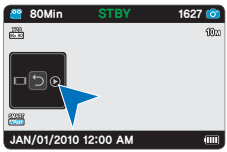
QUICK VIEW

Using the Quick View function, you can view the most recently recorded video or photo right after recording.

1. Press the **OK** button in STBY mode right after recording.
   - The shortcut menu appears on the LCD screen.
2. Press the ▶ button to view the most recent video or photo you have recorded.
   - During Quick View, use the ◀/▶/**OK** buttons to playback/search the current file.
   - Press the **MENU** button to delete the currently displayed recording.
   - After the Quick View is finished, your camcorder switches back to the STBY mode.



Do not operate the **Power** (⏻) button or remove the memory card while accessing the storage media. Doing so may damage the storage media or the data on the storage media.

- Videos are compressed in the H.264 (MPEG-4.AVC) format.
- Eject the battery when you have finished recording to prevent unnecessary battery power consumption.
- For the on-screen information display, see page 13.
- For approximate recording time, see page 28.
- Sound is recorded by the internal stereo microphones located on both sides of the lens. Make sure that the microphones are not blocked.
- Before recording an important video, make sure to test the recording function to see if there are any problems with the audio or video recording.
- The brightness of the LCD screen can be adjusted in the menu options. Adjusting the LCD screen does not affect the image being recorded. ➥page 54
- For various functions available during recording, see “Recording menu items.” ➥pages 41~44
- If the power cable/battery is disconnected or recording is disabled during recording, the system is switched to the data recovery mode. While data is being recovered, no other function is enabled.
- Photo files recorded by your camcorder conform to the “DCF (Design rule for Camera File system)” universal standard established by the JEITA (Japan Electronics and Information Technology Industries Association).
- DCF is an integrated image-file format for digital cameras: Image files can be used on all digital devices conforming to DCF.
- You can switch from the play mode to the record mode by pressing the **Recording start/stop** (🎥●), **Photo** (📷), or **Play** (▶) button.

Caution concerning rise in temperature

During recording, if the temperature of the camcorder rises, a message “**Stop recording to protect the camera from overheat. Switch to STBY when it recovers a normal temperature.**” appears on the LCD screen. Please wait until the temperature drops before using the camcorder again.

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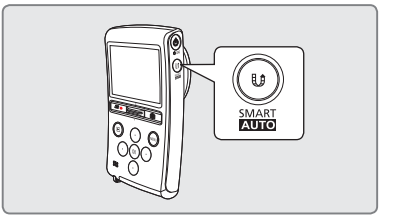
RECORDING WITH AUTO SCENE DETECTION (SMART AUTO)

User-friendly SMART AUTO optimizes your camcorder to the recording conditions automatically, providing beginners with the best performance.

1. Press the **SMART AUTO** button.
   - The Smart Auto (SMART AUTO) icon is appears on the LCD screen.
2. Align your subject in the frame.
   - The camcorder automatically detects the scene as it aligns the focus.
   - The scene icon for the detected scene appears on the LCD screen.



	Appears when recording at night. (Night)
	Appears when recording images of landscapes with backlighting. (Backlight)
	Appears when recording outdoor scene. (Landscape)
	Appears when recording with close-up. (Macro)
	Appears when recording fast moving subjects. (Action)
	Appears when recording portraits. (Portrait)

<Appears when recording fast moving subjects>

3. To record the video or photo, press the **Recording start/stop** (●) or **Photo** (📷) button.
4. To cancel Smart Auto mode, press the **SMART AUTO** button again.

- When the camcorder fails to recognize the recording situations, it records in the basic setting (SMART AUTO).
- The camcorder may not select the correct scene depending on the external conditions, such as camcorder shake, lighting, and distance to the subject.
- The camcorder cannot detect the portrait mode according to the direction or the brightness of faces.
- If the camcorder detects more than one scene at the same time, Smart Auto prioritizes as follows: Night → Backlight → Portrait → Macro → Action → Landscape
  a) If Night and Portrait are detected at the same time, then Night is selected and the corresponding icon appears.
  b) If Backlight and Portrait are detected at the same time, then Backlight is selected and corresponding icon appears.

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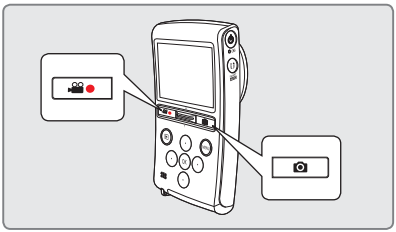
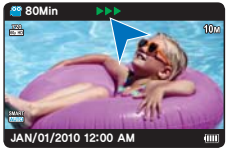
CAPTURING PHOTOS DURING VIDEO RECORDING (DUAL RECORDING)

Your camcorder can capture photos without interrupting video recording. It is convenient to record a video and photo at the same time without switching modes.

1. Press the **Recording start/stop** (●) button.
   - The recording (●) indicator appears, and video recording starts.
2. Aim the camcorder at the scene you want, and then press the (📷) button.
   - When the (▶▶▶) indicator disappears, the photo image is recorded without a shutter sound.
   - Video keeps recording, even while photos are taken.
   - To stop recording, press the **Recording start/stop** (●) button again.





- You cannot capture photos under the following conditions:
  - When you are making a time lapse recording
- The resolution of the captured photos depends on the resolution of the video as follows.

Video resolution	Resolution of captured photo
1080/30p	1920x1080
720/60p, 720/30p	1280x720
480/60p	896x504

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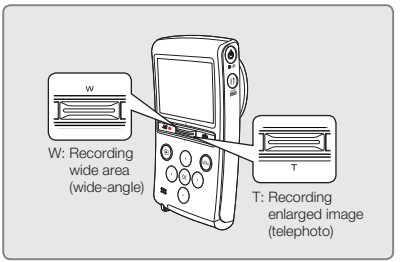
ZOOMING IN AND OUT

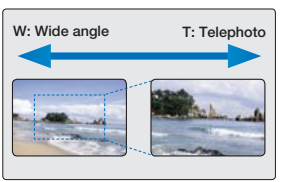
- Use the zoom function for close-up or wide-angle recording.
- This camcorder allows you to record using optical power zoom and Intelli zoom with the **Zoom** lever.



To zoom in

Slide the **Zoom** lever towards **T** (telephoto).

- The distant subject is gradually magnified.
- This camcorder provides the zoom magnification as follows.
  - Optical zoom: x3 (Photo only)
  - Intelli zoom: x3.6 (Video only)



To zoom out

Slide the **Zoom** lever towards **W** (wide angle).

- The subject appears smaller and further away.
- The smallest zoom ratio is the subject's original size in the zoom-out.

- Frequent use of the zoom function consumes more power.
- The minimum focal length between the camcorder and the subject is about 7.87 inches (20cm) for wide angle and about 31.50 inches (80cm) for telephoto.
- If you use the zoom while recording, the camcorder may record the noises the camcorder makes when you operate the zoom.
- During a video recording, the sound is not recorded temporarily when the Zoom function is activated. When you stop zooming, the sound recording resumes.

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CHANGING THE PLAYBACK MODE

- You can set the record mode and the play mode in turn with the **Play** (▶) button.
- When you shift to the play mode, the most recently created file is highlighted in the thumbnail view.
- The camcorder selects the thumbnail display options based on the standby mode you used the last time.
- You can select a thumbnail display of HD Videos, SD Videos, or Photos using the "**Play Mode**" menu. ➥page 45

Understanding how to change the operation modes
You can easily change the operation modes by pressing the buttons as shown in the figures below:

MENU button → "Play Mode" → "HD Video", "SD Video", "Photo"

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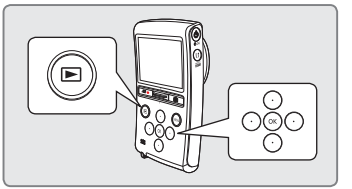
PLAYING VIDEOS

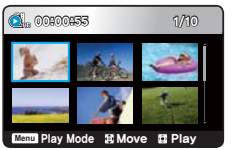
You can find desired videos quickly using the thumbnail index view.

PRECHECK!

Insert a memory card. ➥page 25



1. Press the **Play** (▶) button to select the play mode.
   - The thumbnail index view appears.
   - You can select a thumbnail display of HD Videos, SD Videos, or Photos using the "**Play Mode**" menu. ➥page 45
   - When you select a video file, the playing time appears on the screen.
   - The thumbnail highlight is on the latest created or played file.



2. Press the ▲/▼/◀/▶ button to select the desired video, then press the **OK** button.
   - The Shortcut menu for playback appears and the camcorder plays the video you selected.
   - To return to thumbnail index view while playing, use the **Zoom** lever.

Do not power off or eject the memory card during video playback. Doing so may damage the recorded data.

- The following video files may not play back on the camcorder:
  - Video files with formats that are not supported by the camcorder
- The built-in speaker and LCD screen automatically turn off when you connect the Audio/Video cable to the camcorder. When you connect the camcorder to external devices, you should make volume adjustments on the connected external device.
- You can playback recorded video on a TV or a PC. ➥pages 59~70
- You can upload recorded videos or photos to YouTube, Flickr, or FaceBook using Intelli-studio. ➥page 63
- For various functions available during playback, see "playback options." ➥pages 45~50
- Loading time may vary depending on the resolution of the selected video.

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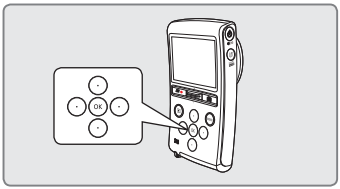
Various playback operations

Still playback (pause) (▶/ II)



- Press the **OK** button during playback.
  - To resume normal playback, press the **OK** button again.

Search playback (◀◀ / ▶▶)

- During playback, press and hold the ◀/▶ button for reverse search/forward search.
- Pressing the ◀/▶ button repeatedly increases the search speed in each direction.
  - RPS (Reverse Playback Search) rate: x2→x4→x8→x16→x32
  - FPS (Forward Playback Search) rate: x2→x4→x8→x16→x32
- To resume normal playback, press the **OK** button.

Skip playback (⏮ / ⏭)

- During playback, press the ▶ button to locate the start point of the next file. Pressing the ▶ button repeatedly skips files in the forward direction.
- During playback, press the ◀ button to locate the start point of the current file. Pressing the ◀ button repeatedly skips files in the reverse direction.
- Press the ◀ button within 3 seconds of the start point of the current file to skip back to the previous file.

Frame-by-frame playback (◀II / II▶)

- During pause, press and hold the ◀/▶ button to make the video go backwards or forwards one frame at a time.
  - To resume normal playback, press the **OK** button.

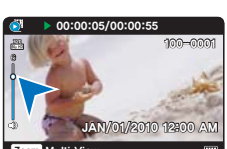
Slow motion playback (II▶)

- During pause, press and hold the ▶ button to make the video go forwards slowly.
- During slow motion playback, pressing the ▶ button changes the playback speed.
  - Forward slow playback rate: x1/2→x1/4→x1/8
  - To resume normal playback, press the **OK** button.

The camcorder does not play sound during search, skip, frame by frame, or slow motion play back.

Adjusting the volume

1. Press the **OK** button to display the shortcut menu.
2. Press the ▲/▼ button to increase or decrease the volume.
   - You can hear the recorded sound from the built-in speaker.
   - The level can be set to anywhere between 0 and 10.



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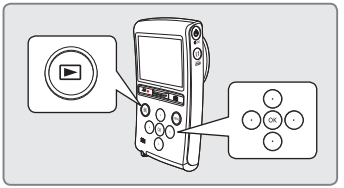
VIEWING PHOTOS

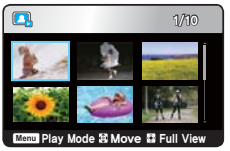
You can find and view desired photos quickly using the thumbnail index view.

PRECHECK!

Insert a memory card. ➥page 25



1. Press the **Play** (▶) button to select the play mode.
   - The thumbnail index view appears.
   - You can select a thumbnail display of HD Videos, SD Videos, or Photos using "**Play Mode**" menu. ➥page 45
   - The thumbnail highlight is on the latest created or played file.
2. Press the ▲/▼/◀/▶ button to select the desired photo, and then press the **OK** button.
   - The Shortcut menu for playback appears and the camcorder displays the photo you selected in full screen view.
   - To view the previous/next file, press the ◀/▶ button.
   - To return to the thumbnail index view, use the **Zoom** lever.



Do not power off or eject the memory card during photo playback. Doing so may damage the recorded data.

- Your camcorder may not play back the following photo files normally:
  - A photo with a file format not supported by this camcorder (it does not conform to DCF standards).
- Loading time may vary depending on the resolution of the photo you selected.
- This camcorder can support the JPEG file format. (However, note that all JPEG files are not always played back.)

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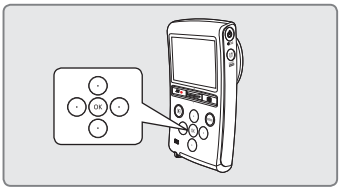
ZOOMING DURING PHOTO PLAYBACK

You can magnify the played back photo image using the **OK** button on the camcorder.



1. Select the photo you want to magnify.
2. Adjust the magnification with the **OK** button.
   - The screen is framed and the image is magnified starting from the center of the image.
   - You can zoom in from x2.0 to x5.0 by pressing the **OK** button.
   - While you use the playback zoom, you can not select other images.
3. Press the ▲/▼/◀/▶ button to put the part of the picture you want in the center of the screen.
4. To cancel, use the **Zoom** lever.

- You cannot apply the playback zoom function to images that are recorded on other devices.
- The playback zoom function is available only in photo single view.

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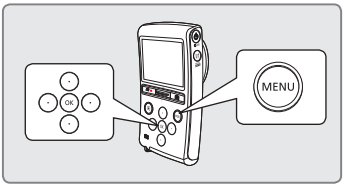
CHANGING THE MENU SETTINGS

- You can change the menu settings to customize your camcorder.
- Access the desired menu screen by following the steps below, then change the various settings.

For example: Setting the Video Resolution in the record mode

1. Press the **MENU** button.
   - The menu screen appears.
2. Press the ◀/▶ button to select "**Video Resolution**."
3. Select the desired submenu item with the ▲/▼ button, and then press the **OK** button.
4. To exit, press the **MENU** button.



- The menu item you selected is applied and the indicator is displayed.
  - However, if you've selected "**Auto**", the camcorder may not display the item's indicator on the screen.
  - You can check the selected mode indicator only when the on-screen information mode is set to full display. ➥page 21
- There are some functions you cannot activate simultaneously in the menu. You cannot select the grayed menu items. Refer to troubleshooting for examples of unworkable combinations of functions and menu items. ➥page 79

RECORDING MENU ITEMS

The menu items you can access depend on the operation mode.
For operation details, see the corresponding page.

Items	Default value	Page
Video Resolution	720/60p	41
Photo Resolution	10M(3648x2736)	42
Time Lapse REC	Off	43

- These items and default values may be changed without notice.
- The camcorder takes photos at 8 mega pixels. When you set the resolution to 10M, the camcorder up-scales the photos you take to 10 mega pixels.

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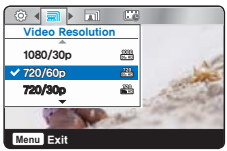
Video Resolution

You can select the resolution of video to be recorded.

PRECHECK!

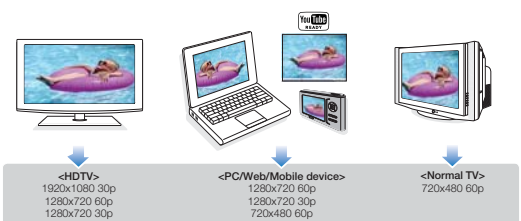
Select the record mode by pressing the **Play** (▶) button. ➥page 20

1. Press the **MENU** button → ◀/▶ button → "**Video Resolution**."
2. Select the desired submenu item with the ▲/▼ button. → **OK** button.
3. Press the **MENU** button to exit the menu.



Submenu items

- **1080/30p** (1080 FULL HD): Records in the HD (1920x1080 30p) format.
- **720/60p** (720 HD): Records in the HD (1280x720 60p) format.
- **720/30p** (720 HD): Records in the HD (1280x720 30p) format.
- **480/60p** (480 WIDE SD): Records in the SD (720x480 60p) format.



- "60p"/"30p" indicates the camcorder will record in progressive scan mode at 60/30 frames per second.
- Recorded files are encoded using Variable Bit Rate (VBR). VBR is an encoding system that automatically adjusts the bit rate according to the recording image.
- High resolution images occupy more memory space than low resolution images. If you select the higher resolution, there is less space to record videos in the memory.
- The recording times depend on the resolution of a video to be recorded. ➥page 28

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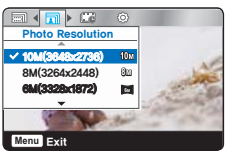
Photo Resolution

You can select the resolution of the photo to be recorded.

PRECHECK!

Select the record mode by pressing the **Play** (▶) button. ➥page 20

1. Press the **MENU** button → ◀/▶ button → "**Photo Resolution**."
2. Select the desired submenu item with the ▲/▼ button. → **OK** button.
3. Press the **MENU** button to exit the menu.



Submenu items

- **10M(3648x2736)** (10M): Records in 3648x2736 resolution with 4:3 aspect ratio.
- **8M(3264x2448)** (8M): Records in 3264x2448 resolution with 4:3 aspect ratio.
- **6M(3328x1872)** (6M): Records in 3328x1872 resolution with 16:9 aspect ratio.
- **5M(2592x1944)** (5M): Records in 2592X1944 resolution with 4:3 aspect ratio.
- **3M(2048x1536)** (3M): Records in 2048x1536 resolution with 4:3 aspect ratio.
- **2M(1920x1080)** (2M): Records in 1920x1080 resolution with 16:9 aspect ratio.

- For photo development, the higher the resolution, the finer the image quality.
- The number of recordable images varies depending on the recording environment.
- High resolution images occupy more memory space than low resolution images. If you select a higher resolution, there is less space to store photos in the memory.
- For detailed information on image capacity, see page 28.
- The camcorder takes photos at 8 mega pixels. When you set the resolution to 10M, the camcorder up-scales the photos you take to 10 mega pixels.

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Time Lapse REC

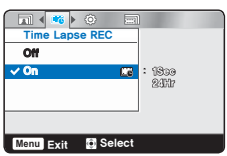
Using the Time Lapse feature, you can program your camcorder to create a time lapse video by recording a series of frames over a set period of time with a set time interval between each frame. The Time Lapse feature lets you create time lapse videos of blooming flowers and similar subjects.

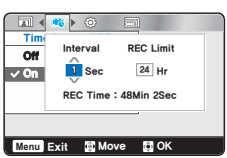
PRECHECK!

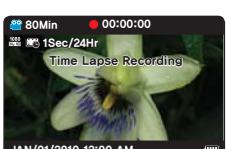
Select the record mode by pressing the **Play** (▶) button. ➥page 20

To record in the Time Lapse REC mode, you must set the recording interval between frames and the total time the camcorder will record in Time Lapse, using the menu.

1. Press the **MENU** button → ◀/▶ button → "**Time Lapse REC**."
2. Press the ▲/▼ button to select "**On**," then press the **OK** button.
   - The recording interval and total time for recording items appear. ("**Sec**": seconds, "**Hr**": hours)
3. Set the desired recording interval ("**Sec**") with the ▲/▼ button.
4. Press the ▶ button and set the desired total recording time ("**Hr**") in the same way.
   - The approximate time-lapse recording time is displayed on the menu screen.
5. Press the **OK** button to finish the setting, and then press the **MENU** button to exit the menu.
6. After setting the Time Lapse REC mode, press the **Recording start/stop** (●) button.
   - Time Lapse REC only supports the 1080/30p resolution.







Submenu items

- **Off:** Disables Time Lapse REC.
- **On (📷):** Turns on the Time Lapse recording function.
  Images are automatically shot a frame at a time at the specified interval and stored in the storage media.
  - Interval ("**Sec**"): Image of the subject is captured at the set interval.
    1 → 5 → 10 → 30 Sec
  - REC Limit ("**Hr**"): Total time from start to finish of recording.
    24 → ∞ Hr

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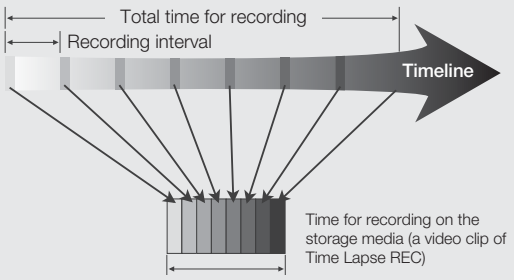
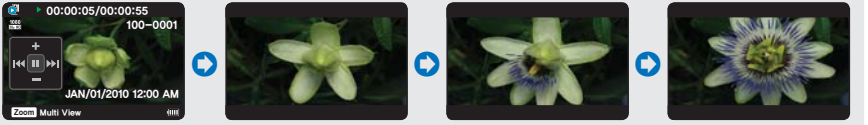
Example of Time Lapse Recording


Total time for recording
Recording interval
Timeline
Time for recording on the storage media (a video clip of Time Lapse REC)

The Time Lapse Recording function records image frames at a predefined interval over the total recording time to produce a time-lapse video.

Time Lapse Recording is useful for filming in the following situations:

- Blooming flowers
- A bird building a nest
- Clouds rolling by in the sky



- This function is shut off after being used one time.
- 30 captured images compose a video of 1 second length. Since the minimum length of a video your camcorder can save is one second, the interval defines how long the Time Lapse Recording should be. For example, if you set the interval to "**30 Sec**," total recording time should be set to at least 15 minutes to record a minimum video length of 1 second (30 images).
- Once the Time Lapse REC finishes recording for its total recording time, the camcorder switches to standby mode.
- Press the **Recording start/stop** (●) button if you want to stop the Time Lapse REC.
- Audio is not recorded during Time Lapse Recording.
- If a video recording fills up 3.8GB of storage media, a new recording file is automatically started at that point.
- If the battery charge is exhausted during Time Lapse REC, the camcorder saves the recording up to that point, and then switches to standby mode. After a while, it displays a warning message, then turns off automatically.
- If memory runs out during a Time Lapse REC, the camcorder switches to standby mode after saving what was recorded so far.
- We recommend using the AC power adaptor when using the Time Lapse REC function.

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PLAYBACK MENU ITEMS

- The menu items you can access depend on the operation mode.
- For operation details, see the corresponding page.

● : Accessible
× : Not accessible

Items		Video		Photo		Page
		Thumbnail view	Single view	Thumbnail view	Single view	
Play Mode		●	×	●	×	45
Delete		●	●	●	●	46
Protect		●	●	●	●	47
Edit	Divide	●	●	×	×	48
Share Mark		●	●	×	×	49
Slide Show		×	×	●	●	50
File Info		●	●	●	●	50

- These items and default values may be changed without notice.
- Depending on the mode you select, not all items can be selected and changed. Before selecting a menu item, set the appropriate operation mode first. ➥page 20

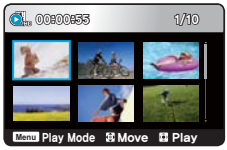
Play Mode

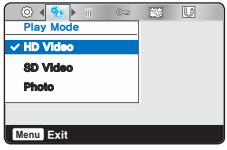
When you select Play, your camcorder lets you select whether to display HD videos, SD videos, or photos in the thumbnail index view. Select one of these Playback modes before playback.

PRECHECK!

Select the play mode by pressing the **Play** (▶) button. ➥page 20

1. Press the **MENU** button → "**Play Mode**."
2. Select the desired submenu item with the ▲/▼ button. → **OK** button.
3. Press the **MENU** button to exit the menu.





Submenu items

- **HD Video:** Your camcorder displays HD videos in the thumbnail index view.
- **SD Video:** Your camcorder displays SD videos in the thumbnail index view.
- **Photo:** Your camcorder displays photos in the thumbnail index view.

These Playback mode settings are available in thumbnail view only.

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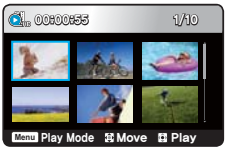
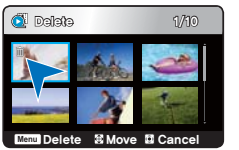
Delete

PRECHECK!

- Insert a memory card. ➥page 25
- Select the play mode by pressing the **Play** (▶) button. ➥page 20
- Set the Playback mode to "**HD Video**," "**SD Video**," or "**Photo**." ➥page 45

1. Press the **MENU** button → ◀/▶ button → "**Delete**."
2. Select the desired submenu item with the ▲/▼ button. → **OK** button.
   - The message corresponding to the selected option appears.
3. Select "**Yes**" with the ◀/▶/**OK** button.
   - The selected image is deleted.





Submenu items

- **Select Files**: Select and delete individual videos or photos.
  1. Select the videos or photos you want to delete by pressing the **OK** button, and then pressing the **MENU** button.
     - The indicator (🗑) is displayed on the videos or photos you select.
     - Pressing the **OK** button toggles between selecting the videos or photos for deletion or not.
  2. Select "**Yes**", and then press the **OK** button to delete.
- **All Files**: Deletes all videos or photos.

- Deleted images cannot be recovered.
- Do not eject a memory card or power off while deleting videos recorded on the storage media. Doing so may damage the storage media or data.

- If the battery's charge is low, the delete function may not operate. To prevent an unexpected loss of power while deleting, use the AC power adaptor if possible.
- To protect important images from accidental deletion, activate image protection. ➥page 47
- You can not delete protected files. To delete, cancel the protect function first. You must release the protect function to delete the image.
- If the write protection tab on the memory card is set to lock, you cannot delete. ➥page 26
- You can also format the storage media to delete all the images at once. Be aware that all files and data including protected files will be erased. ➥page 52
- You can also operate this function in the full and single image display mode.

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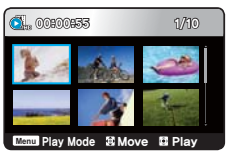
Protect

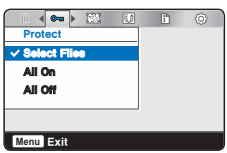
You can protect important saved videos or photos from accidental deletion.
You can not delete protected images unless you release the protection or format the memory.

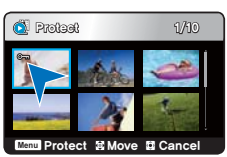
PRECHECK!

- Insert a memory card. ➥page 25
- Select the play mode by pressing the **Play** (▶) button. ➥page 20
- Set the Playback mode to "**HD Video**," "**SD Video**," or "**Photo**." ➥page 45

1. Press the **MENU** button → ◀/▶ button → "**Protect**."
2. Select the desired submenu item with the ▲/▼ button. → **OK** button.
   - The message corresponding to the selected option appears.
3. Select "**Yes**" with the ◀/▶/**OK** button.
   - The (🔑) indicator appears on the protected file.







Submenu items

- **Select Files:** Protect individual videos or photos from deletion.
  1. Select the videos or photos you want to protect by pressing the **OK** button, and then pressing the **MENU** button.
     - The indicator (🔑) is displayed on the videos or photos you select.
     - Pressing the **OK** button toggles the selection between protection and release.
  2. Select "**Yes**" and then press the **OK** button to confirm.
- **All On**: Protects all videos or photos.
- **All Off**: Cancels the protection for all videos or photos.

- If the write protection tab on the memory card is set to lock, you cannot set image protection.
- You can also operate this function in the full and single image display mode.

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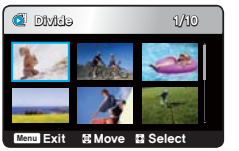
Divide

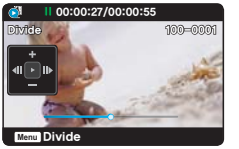
You can divide a video into two, and easily delete a section you no longer need. As this function edits the original file, make sure to back up important recordings separately.

PRECHECK!

- Insert a memory card. ➥page 25
- Select the play mode by pressing the **Play** (▶) button. ➥page 20
- Set the Playback mode to "**HD Video**" or "**SD Video**." ➥page 45

1. Press the **MENU** button → ◀/▶ button → "**Edit: Divide**" → **OK** button.
2. Select the desired video with the ▲/▼/◀/▶ → **OK** button.
   - The selected video pause.
3. Search for the point of division by using the ◀/▶ button.
4. Press the **OK** button to pause at the point of division, and then press the **MENU** button.
   - A message appears asking for your confirmation.
5. Select "**Yes**" with the ◀/▶/**OK** button.
   - The selected video is divided into two videos.
   - An image from the second part of the divided video will be displayed at the end of the thumbnail index.





- Do not eject a memory card or power off while editing a video recorded on the storage media.
- Doing so may damage the storage media or data.

- You can not divide files that are protected and display the protected indicator (🔑). Cancel the protect function first. ➥page 47
- The divided video may drift before or after the division point by approx. 0.5 seconds.
- The Divide function is not available under the following conditions:
  - If the total recorded time of the video is less than 6 seconds.
  - If you are trying to divide sections without leaving 3 seconds at the beginning and at the end.
  - If the remaining memory space is less than 15MB.

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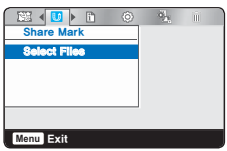
Share Mark

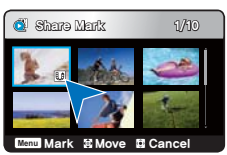
You can set the share mark on a video and directly upload the marked file to the YouTube site.

PRECHECK!

- Insert a memory card. ➥page 25
- Select the play mode by pressing the **Play** (▶) button. ➥page 20
- Set the Playback mode to "**HD Video**" or "**SD Video**." ➥page 45

1. Press the **MENU** button → ◀/▶ button → "**Share Mark**" → **OK** button.
2. Select the desired video with the ▲/▼/◀/▶ → **OK** button.
   - The indicator (♪) is displayed on the selected videos.
   - You can also set the share mark on the video by simply pressing the **Share** (♪) button.
3. Press the **MENU** button.
   - A message appears asking for your confirmation.
4. Select "**Yes**" with the ◀/▶/**OK** button.





Share marking procedure for a video longer than 10 minutes

When uploading a video file to a website such as YouTube, the one-time upload capacity is a maximum of 100MB or 10 minutes.
To upload a video over 10 minutes long, follow the procedure below to automatically divide it into 10 minute segments with a share mark added:

1. Move to the desired file by pressing the ▲/▼/◀/▶ button and press the **OK** button.
2. Press the **Share** (♪) button.
3. Move to "**Yes**" by pressing the ◀/▶ button, and then press the **OK** button.
   - After dividing the video file into 10 minute segments, move to the thumbnail index view.
   - The share mark (♪) appears on each divided video file.

By using the Intelli-studio software embedded in the camcorder, you can easily upload videos marked with share marks. ➥page 64

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Slide Show

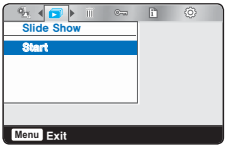
You can playback all the photos stored in the storage media automatically.

PRECHECK!

- Insert a memory card. ➥page 25
- Select the play mode by pressing the **Play** (▶) button. ➥page 20
- Set the Playback mode to "**Photo**." ➥page 45

Press the **MENU** button → ◀/▶ button → "**Slide Show**" → **OK** button.

- The indicator (▶) is displayed and the slide show starts from the current image.
- All photos are played back consecutively for 3 seconds each.
- To stop the slide show, press the ▲,▼, **OK** or **MENU** button.



File Info

You can see the image information for all images.

PRECHECK!

- Insert a memory card. ➥page 25
- Select the play mode by pressing the **Play** (▶) button. ➥page 20
- Set the Playback mode to "**HD Video**," "**SD Video**." or "**Photo**." ➥page 45

1. Press the **MENU** button → ◀/▶ button → "**File Info**" → **OK** button.
2. Select the desired video or photo with the ▲/▼/◀/▶ → **OK** button.
   - The following information for the image you selected appears:
     - Date, Duration, Size, Resolution
3. To exit, press the **MENU** button.

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SETTING MENU ITEMS

You can setup the date/time, OSD language, and display settings of the camcorder.
For operation details, see the corresponding page.

Items	Default values	Page
Storage Info	-	51
Format	-	52
File No.	Series	53
Date/Time Set	JAN/01/2010 12:00 AM	53
LCD Brightness	Bright	54
Auto LCD Off *	On	54
Beep Sound	On	55
Shutter Sound	On	55
Auto Power Off *	5 Min	56
PC Software	On	56
TV Connect Guide	-	57
TV Display	On	57
Default Set	-	58
Language	English	58
Anynet+ (HDMI-CEC)	On	58

- Items marked with * are available only when you supply power to the camcorder using the battery.
- These items and default values may be changed without notice.

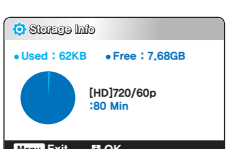
Storage Info

Storage Info displays the storage information. You can view the storage media, used memory space, and available memory space.

PRECHECK!

Insert a memory card. ➥page 25

1. Press the **MENU** button ➞ ◀/▶ button ➞ "**Settings**."
2. Press the ▲/▼ button ➞ "**Storage Info**" ➞ **OK** button.
   - Used memory space, memory space available for use, and the available recordable time depending on the selected video resolution appears.
3. Press the **MENU** button to exit the menu.



- The actual capacity may be less than the capacity displayed on the LCD screen as the camcorder's system files occupy a part of the capacity.
- If there is no storage media inserted, it cannot be selected and will be dimmed on the menu.

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Format

The format function deletes all files (including protected files) and options on the storage media. You can also use this function if you want to correct problems with the storage media.

PRECHECK!

Insert a memory card. ➥page 25

1. Press the **MENU** button → ◀/▶ button → "**Settings**."
2. Press the ▲/▼ button → "**Format**" → **OK** button.
3. Select "**Yes**" with the ◀/▶/**OK** button.

- Do not remove the storage media or perform any other operation (such as turning off the power) during formatting. Also, be sure to use the provided AC power adapter, as the storage media may be corrupted if the battery becomes exhausted during formatting.
- If the storage media becomes corrupted, format it again.

- **Do not format the storage media on a PC or other device.**
  Make sure to format the storage media on this camcorder.
- You can not format a memory card with the protection tab set to lock. ➥page 26
- If there is no storage media inserted, it can not be selected and will be dimmed on the menu.
- You must format storage media you used in other devices or newly purchased memory cards with this camcorder before using them. This enables stable speeds and operation when accessing the storage media.
- Be aware that formatting erases all files and data including protected files.

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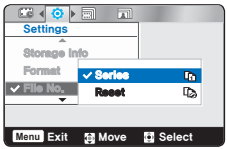
File No.

The camcorder assigns file numbers to recorded files in the order they were recorded.

1. Press the **MENU** button → ◀/▶ button → "**Settings**."
2. Press the ▲/▼ button → "**File No**." → **OK** button.
3. Select the desired submenu item with the ▲/▼ button. → **OK** button.
4. Press the **MENU** button to exit the menu.



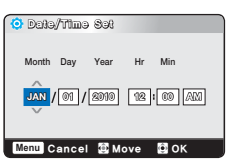
Submenu items

- **Series :** Assigns file numbers in sequence even if you replace the memory card with another one, format the card, or delete all files. The file number is reset when a new folder is created.
- **Reset :** Resets the file number to 0001 even after you format the memory card, delete all files, or insert a new memory card.

When you set "**File No.**" to "**Series**," each file is assigned a different number to avoid duplicating file names. This is convenient when you want to manage your files on a PC.

Date/Time Set

Set the current date and time so the camcorder can record them correctly. ➥page 23



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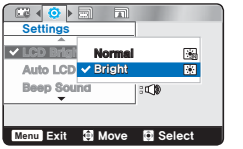
LCD Brightness

You can adjust the brightness of the LCD screen to compensate for ambient lighting conditions.

1. Press the **MENU** button → ◀/▶ button → "**Settings**."
2. Press the ▲/▼ button → "**LCD Brightness**" → **OK** button.
3. Select the desired submenu item with the ▲/▼ button. → **OK** button.
4. Press the **MENU** button to exit the menu.



Submenu items

- **Normal**: Standard brightness.
- **Bright**: Brightens the LCD screen.

Auto LCD Off

To reduce power consumption, the camcorder automatically dims the brightness of the LCD screen if the camcorder is idle for a period of time.

1. Press the **MENU** button → ◀/▶ button → "**Settings**."
2. Press the ▲/▼ button → "**Auto LCD Off**" → **OK** button.
3. Select the desired submenu item with the ▲/▼ button. → **OK** button.
4. Press the **MENU** button to exit the menu.

Submenu items

- **Off :** Disables the function.
- **On :** When there is no operation for a period of time in the STBY mode or during recording, the camcorder reduces power consumption by automatically dimming the LCD screen.

- If the "**Auto LCD Off**" function is enabled and the LCD screen dims, you can press any button on the camcorder to return the LCD screen's brightness to normal.
- **Auto LCD Off is disabled in the following cases:**
  - If you have connected the AC power adaptor and are using it to power the camcorder.
  - If you have connected the built-in USB plug of the camcorder to a PC.

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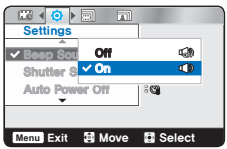
Beep Sound

You can set the beep sound on or off. If you hear a beep sound when operating the menu settings, the setting is turned on.



1. Press the **MENU** button → ◀/▶ button → "**Settings**."
2. Press the ▲/▼ button → "**Beep Sound**" → **OK** button.
3. Select the desired submenu item with the ▲/▼ button. → **OK** button.
4. Press the **MENU** button to exit the menu.

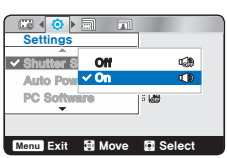
Submenu items

- **Off:** The beep sound is off.
- **On:** A beep will sound every time you press a button.

The Beep sound function is canceled in the following cases:
- During recording and playing
- When the camcorder has a cable connection. (Audio/Video cable)

Shutter Sound

You can turn the shutter sound on or off.



1. Press the **MENU** button → ◀/▶ button → "**Settings**."
2. Press the ▲/▼ button → "**Shutter Sound**" → **OK** button.
3. Select the desired submenu item with the ▲/▼ button. → **OK** button.
4. Press the **MENU** button to exit the menu.

Submenu items

- **Off:** The shutter sound is off.
- **On:** The shutter will sound each time you press the **Photo** (📷) button.

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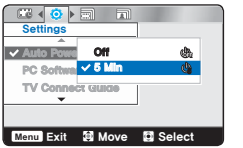
Auto Power Off

To save battery power, you can set the "**Auto Power Off**" function to 5 Min. This setting turns off the camcorder if there is no operation for five minutes.

1. Press the **MENU** button → ◀/▶ button → "**Settings**."
2. Press the ▲/▼ button → "**Auto Power Off**" → **OK** button.
3. Select the desired submenu item with the ▲/▼ button. → **OK** button.
4. Press the **MENU** button to exit the menu.



Submenu items

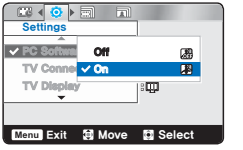
- **Off:** The camcorder does not turn off automatically.
- **5 Min:** The camcorder automatically turns off if there is no operation for 5 minutes in STBY mode or in thumbnail index view.

- **Auto Power Off is disabled in the following cases:**
  - If you have connected the AC power adaptor and are using it to power the camcorder.
  - If you have connected the built-in USB plug of the camcorder to a PC.
  - During recording, playing (pause excluded), or a slideshow.
- Press the **Power** (⏻) button to restart the camcorder.

PC Software

Your camcorder contains built-in PC software. If you set PC Software on, you can use this PC software to download and edit videos and photos by connecting the built-in USB plug of the camcorder to your PC.

1. Press the **MENU** button → ◀/▶ button → "**Settings**."
2. Press the ▲/▼ button → "**PC Software**" → **OK** button.
3. Select the desired submenu item with the ▲/▼ button. → **OK** button.
4. Press the **MENU** button to exit the menu.



Submenu items

- **Off:** Disables the function.
- **On:** You can use the PC software by connecting the built-in USB plug of the camcorder to your PC.

The PC Software is compatible with Windows operating systems only.

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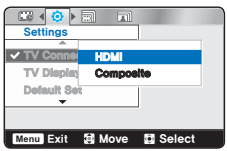
TV Connect Guide

Follow the directions in the TV Connect Guide to connect the camcorder to your type of TV correctly. Shows information on the cables and jacks used to connect the camcorder to a TV.

1. Press the **MENU** button → ◀/▶ button → "**Settings**."
2. Press the ▲/▼ button → "**TV Connect Guide**" → **OK** button.
3. Select the desired submenu item with the ▲/▼ button. → **OK** button.
4. Press the **MENU** button to exit the menu.



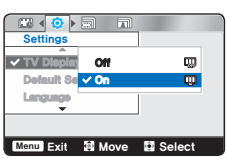
Submenu items

- **HDMI:** Select when you want to know how to connect an HDMI cable (optional) to a TV.
- **Composite:** Select when you want to know how to connect a composite (Video, Audio L/R) cable to a TV.

TV Display

When the camcorder is connected to a TV, you can turn the camcorder's on screen display (OSD) on and off on the TV screen.

1. Press the **MENU** button → ◀/▶ button → "**Settings**."
2. Press the ▲/▼ button → "**TV Display**" → **OK** button.
3. Select the desired submenu item with the ▲/▼ button. → **OK** button.
4. Press the **MENU** button to exit the menu.



Submenu items

- **Off:** The camcorder's OSD does not appear on the screen of the connected TV.
- **On:** The camcorder's OSD appears on the screen of the connected TV.

The "**TV Display**" function only lets you display or not display the camcorder's screen indicators on the TV screen. Setting it to "**Off**" does not remove screen indicators from the camcorder's LCD screen.

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Default Set

You can initialize your camcorder settings to the factory defaults (initial settings at the factory). Initializing the camcorder settings to factory defaults does not affect recorded images.

1. Press the **MENU** button → ◀/▶ button → "**Settings**."
2. Press the ▲/▼ button → "**Default Set**" → **OK** button.
3. Select "**Yes**" with the ◀/▶/**OK** button.
   - Select "**No**" to cancel the Default Set.
   - All setting values are initialized to the factory default.

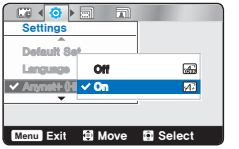
- After resetting the camcorder, reset the "**Date/Time Set**." ➥page 23
- Do not turn off the power while initializing the settings.
- The "**Default Set**" function does not affect the files recorded on the storage media.

Language

You can select a language in which to display the menu and messages. ➥page 24

Anynet+ (HDMI-CEC)

This camcorder supports Anynet+. It is an AV network system that enables you to control all connected Samsung AV devices with an Anynet+ supported Samsung TV remote control.



1. Press the **MENU** button → ◀/▶ button → "**Settings**."
2. Press the ▲/▼ button → "**Anynet+ (HDMI-CEC)**" → **OK** button.
3. Select the desired submenu item with the ▲/▼ button. → **OK** button.
4. Press the **MENU** button to exit the menu.

Submenu items

- **Off:** Disables the function.
- **On:** The Anynet+ function is enabled.

- When you turn on your camcorder and it is connected via an HDMI cable to a TV that supports Anynet+, the camcorder's Anynet+ (HDMI-CEC) function automatically turns on. If you do not want to use the Anynet+ function, set "**Anynet+ (HDMI-CEC)**" to "**Off**."
- For details on the Anynet+ (HDMI-CEC) function, refer to the user manual of the Samsung TV with Anynet+.

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WHAT YOU CAN DO WITH A WINDOWS COMPUTER

You can perform the following functions by connecting your camcorder to your Windows computer with the built-in USB plug and using the Intelli-studio software built into your camcorder.

Main functions

- Intelli-studio editing software main functions:
  - Playing back recorded videos or photos. ➥page 62
  - Editing recorded videos or photos. ➥page 62
  - Uploading the recorded videos and photos to Youtube, Flickr, FaceBook, etc. ➥page 63
- You can also transfer or copy the files (videos and photos) saved on your storage media into your computer. (the mass storage function) ➥page 66

System requirements

The following requirements must be satisfied to use the built-in editing software (Intelli-studio):

Items	Requirement
OS	Microsoft Windows XP SP2, Vista, or Windows 7
CPU	Intel® Core 2 Duo® 1.66 GHz or higher is recommended AMD Athlon ™ X2 Dual-Core 2.2 GHz or higher is recommended (Notebook: Intel Core2 Duo 2.2GHz or AMD Athlon X2 Dual-Core 2.6GHz or higher is recommended)
RAM	1GB or higher is recommended
Video Card	nVIDIA Geforce 7600GT or higher Ati X1600 series or higher
Display	1024 x 768, 16-bit color or higher (1280 x 1024, 32-bit color recommended)
USB	USB 2.0
Direct X	DirectX 9.0c or higher

- System requirements listed above are minimum requirements. Even on a system that satisfies the requirements, Intelli-studio may not operate optimally.
- On a slower than recommended computer, video playback may skip frames or operate erratically.
- If the version of DirectX on your computer is lower than 9.0c, install DirectX 9.0c or higher.
- We recommend transferring recorded videos to a PC before playing back or editing them.
- To run Intelli-studio, a laptop computer requires faster and better components than a desktop PC.
- The built-in software on your camcorder, 'Intelli-studio' is not Macintosh compliant.

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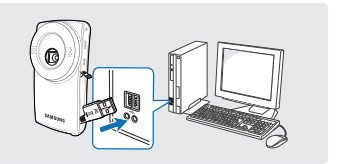
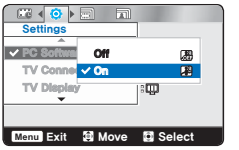
USING THE Intelli-studio PROGRAM

Using the Intelli-studio program built into your camcorder, you can transfer video and photo files to your PC and edit them on your PC screen. Intelli-studio offers the most convenient way for you to manage your video and photo files.



Step 1. Connecting the USB cable

1. Set "**PC Software: On**."➥page 56
   - This is the default setting.
2. Connect the built-in USB plug of the camcorder to the USB port of the PC.
   - A new file saving screen appears with the Intelli-studio main window.
   - Depending on your version of Windows, the removable disk window also appears.
3. Click "**Yes.**" The uploading procedure starts. Click "**Yes**" to confirm.
   - If you do not want to save a new file, select "**No.**"



To disconnect the USB cable

To disconnect the USB cable after completing the file transfer, you must follow these steps:

1. Click the "**Safely Remove Hardware icon**" icon on the taskbar.
2. Select "**USB Mass Storage Device,**" and then click "**Stop.**"
3. If the "**Stop a Hardware device**" window appears, click "**OK.**"
4. Disconnect the camcorder's built-in USB plug from the PC.

- Make sure you insert the USB plug into the USB jack with the plug facing in the correct direction.
- Use the AC power adaptor to power the camcorder when transferring files to your computer.
- When the built-in USB plug is connected, turning the camcorder on or off may cause the PC to malfunction.
- If you disconnect the built-in USB plug from the PC or the camcorder while transferring files, the data transmission will stop and the data may be damaged.
- If you connect the built-in USB plug to a PC via a USB HUB or simultaneously connect the built-in USB plug along with other USB devices, the camcorder may not work properly. If this occurs, remove all USB devices from the PC and reconnect the camcorder.
- Intelli-studio may not automatically run. If this occurs, access My Computer or Windows Explorer, open the drive that corresponds to your camcorder, find Intelli-studio, and then run IStudio.exe.

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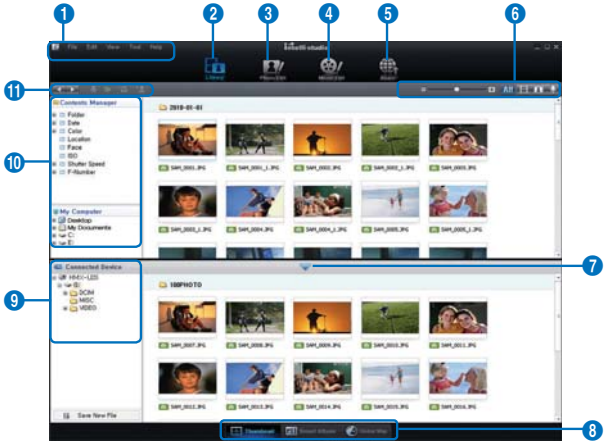
Step 2. About the Intelli-studio main window

When the Intelli-studio starts up, thumbnails of videos and photos are displayed in the main window.



1. Menu items
2. Switches to Library of the computer and connected camcorder.
3. Switches to Photo Edit mode.
4. Switches to Movie Edit mode.
5. Switches to Share mode.
6. Changes the size of thumbnails.
   - All Displays all files (videos and photos).
   - Displays video files only.
   - Displays photo files only.
   - Displays voice files only.
7. Minimizes the connected device screen.
8. Displays videos and photos in various ways.
   - Thumbnails: Displays video and photo thumbnails
   - Smart Album: Arranges multiple videos and photos by various classifications.
   - Global Map: Displays the location of shooting place with a map.
9. Selects the connected device.
10. Shows directories of Contents Manager and My Computer.
    - Contents Manager: You can classify and manage videos and photos on your computer.
    - My Computer: You can view videos and photos saved in the selected directory of your computer.
11. Shortcut icons
    - Navigates files (previous and next).
    - Prints selected photo(s).
    - Views location of selected photo(s) with GPS information.
    - Registers to Contents Manager.
    - Manages the registry of faces in the selected photo.

Intelli-studio is a program commonly used in Samsung camcorders or digital cameras. Some functions may not work, depending on the product you purchased.

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Step 3. Playing back videos or photos

You can play back recordings conveniently using the Intelli-studio application.

1. Run the Intelli-studio program. ➥page 61
2. Click the desired folder to display your recordings.
   - Video or photo thumbnails appear on the screen, depending on the folder you selected.
3. Choose the video or photo that you want to play.
   - You can view the file information by moving the mouse over the thumbnail.
   - If you click a video thumbnail once, the video plays back inside the thumbnail frame, allowing you to search for a desired video with ease.
4. Once you select the desired video or photo, double-click to play back.
   - Playback starts and playback controls appear.

Intelli-studio supports the following file formats:
- Video formats: MP4 (Video: H.264, Audio: AAC), WMV (WMV 7/8/9)
- Photo formats: JPG, GIF, BMP, PNG, TIFF

Step 4. Editing videos or photos

With Intelli-studio, you can edit videos or photos in various ways.
(For example, Change Size, Fine-Tune, apply Image Effect, Insert Frame, etc.)

- Before editing a video or photo in Intelli-studio, copy the video or photo file to your computer for safe-keeping using My Computer or Windows Explorer.

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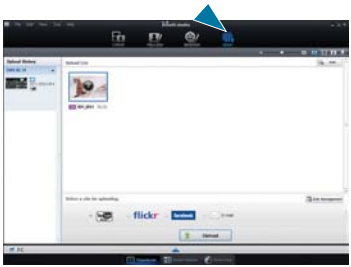
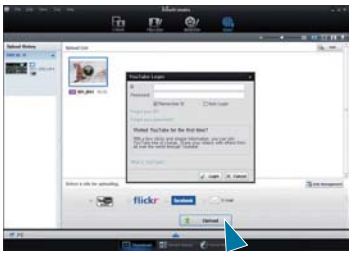
Step 5. Sharing the videos/photos online

Share your contents with the world, by uploading photos and videos directly to a web site with one click.

1. Select the videos or photos you want to share.
2. Click "**Share**" on the Intelli-studio browser.
   - The selected file appears on the sharing window.
3. Click the web site you would like to upload files to.
   - You can choose "YouTube," "Flickr," "Facebook," or a web site you want to use for your uploading management.
4. Click "**Upload**" to start uploading.
   - A pop-up window appears asking for your ID and password.
5. Enter your ID and password to access.
   - Access to the web site contents can be limited depending on your web access environment.





For more information about Intelli-studio use, see the Help Guide by clicking "**Help**."

- Flickr is an image hosting website, web services suite, and online community platform. In addition to being a popular website for users to share personal photographs, the service is widely used by bloggers as a photo repository.
- **http: //www.flickr.com/**

- Facebook is a global social networking website that is operated and privately owned by Facebook, Inc. Users can add friends and send them messages, and update their personal profiles to notify friends about themselves. Additionally, users can join networks organized by city, workplace, school, and region.
- **http: //www.facebook.com/**

- YouTube is a video sharing website. Users can upload, view, and share personalized video clips. The San Bruno-based service uses Adobe Flash technology to display a wide variety of users-generated contents including video clips, TV clips and music videos, as well as amateur contents such as video blogging and short original videos.
- **http: //www.youtube.com/**

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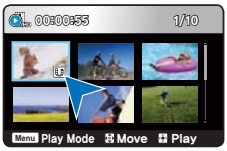
Direct uploading your videos onto YouTube

The One-Press Share ( ) button lets you directly upload and share your videos on YouTube. Just press the Share ( ) button while your camcorder is connected to a Windows computer using the built-in USB plug.

Step 1

On the camcorder, select a video you want to upload in the video thumbnail index view, and then press the Share ( ) button. Repeat for each video you want to upload.

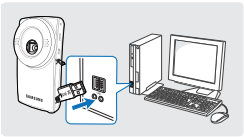
- The Share mark ( ) appears on each video.
- You can also set the Share mark on selected videos using the menu. ➥page 49



Step 2

Connect the built-in USB jack of the camcorder to the USB port of the PC.

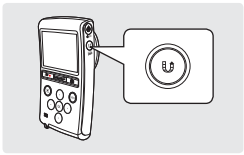
- If you have set "**PC Software: On**", Intelli-studio runs automatically on a Windows computer after you've connected the camcorder.



Step 3

Press the Share ( ) button while your camcorder is connected to a computer.

- A pop-up sharing window displaying the videos with Share marks appears on the screen.
- Click "**Yes**" on the PC screen to begin uploading your videos to YouTube.
- If you want to upload directly without showing a pop-up sharing window, check "Intelli-studio does not show a list of share marked files from the connected device."



- As part of the uploading process, the videos you marked are converted into a format playable by YouTube before actually uploading. Time spent uploading may vary depending on such conditions as file size, computer performance, and network speed.
- There is no guarantee the uploading operation will work in all environments. YouTube server-side changes in the future may disable this function.
- For more information on YouTube, visit the YouTube website: http://www.youtube.com/
- This product's YouTube uploading functionality is provided under the license from YouTube LLC. The presence of YouTube uploading functionality in this product is not an endorsement of or recommendation for the product by YouTube LLC.
- If you do not have an account on a specified website, you must register first before proceeding with the authorization.
- According to YouTube's policy, direct video uploading may not be available in your nation / region.

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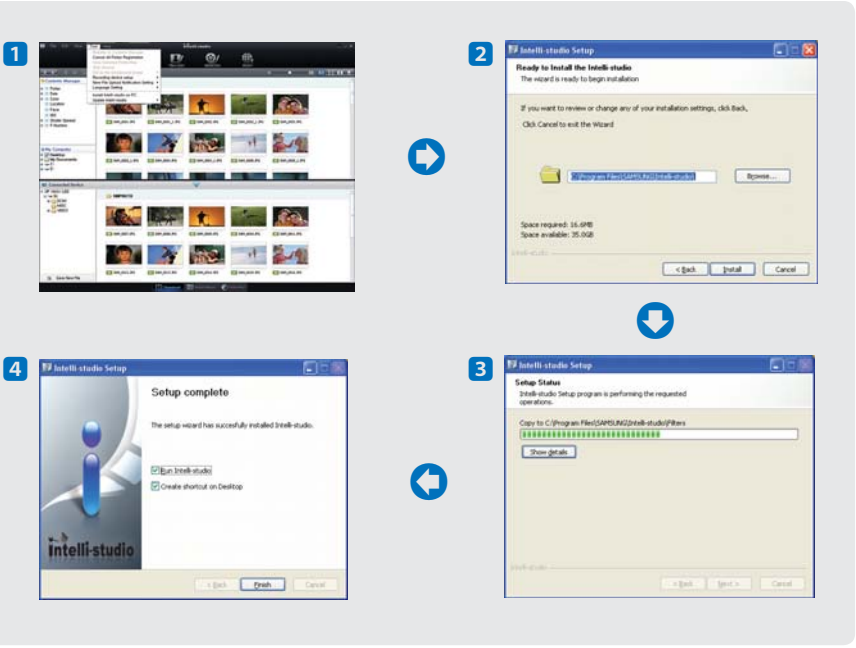
Installing Intelli-studio on a Windows computer

- The Intelli-studio application will run faster if you install it on your Windows computer. Also, if you install it on your computer, it can be updated automatically.
- Follow these directions to install Intelli-studio onto your Windows computer: Click "**Tool**" → "**Install Intelli-studio on PC**" on the Intelli-studio screen, then follow the steps below.



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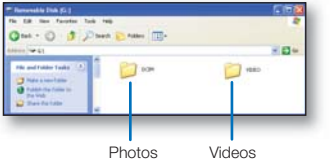
USING AS A REMOVABLE STORAGE DEVICE

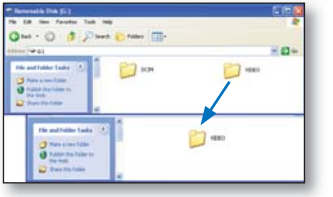
You can transfer or copy recorded data to a Windows computer by connecting the USB cable to the camcorder.

Viewing the contents of storage media

1. Set "**PC Software: Off**." ➥page 56
2. Insert a memory card.
3. Connect the built-in USB jack of the camcorder to the USB port of the PC. ➥page 60
   - The "Removable Disk" or "Samsung" window appears on the PC's screen after a moment.
   - Select "Open folder to view files using Windows Explorer", and then click "OK."
4. The folders in the storage media appear.
   - Different file types are stored in different folders.
5. Select the desired folder or files to copy, then drag and drop them into the destination folder.
   - The folder or files are copied from the storage media to the PC.

Removable Disk (G:)
Windows can perform the same action each time you insert a disk or connect a device with this kind of file:
Pictures
What do you want Windows to do?
using Photo Printing Wizard
View a slideshow of the images
using Windows Picture and Fax Viewer
Copy pictures to a folder on my computer
using Microsoft Scanner and Camera Wizard
Browse picture files
using MediaShow
Open folder to view files
using Windows Explorer
Always do the selected action.
OK
Cancel





- If the "Removable Disk" window does not appear, confirm the connection (➥page 60) or perform Steps 1 through 4 again.
- If the removable disk does not appear automatically, open the removable disk folder in My Computer.
- If the connected camcorder's disk drive does not open or the context menu that appears when right clicking your mouse (open or browse) appears broken, your computer may to be infected by an Autorun virus. Please update your anti-virus software to its latest version and scan your disk drives.

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Structure of folders and files on the storage media

- The folder and file structure for storage media is below.
- File naming follows DCF (Design rule for Camera File System) rules.

Video file (H.264) ①

- The HD-quality (1920x1080 30p, 1280x720 60p, or 1280x720 30p) videos have an HDV_####.MP4 format.
- The SD-quality videos have an SDV_####.MP4 format.
- The file number automatically increases when a new video file is created.
- Up to 9,999 files can be stored in one folder. A new folder is created when more than 9,999 files have been created.

Photo file ②

- As with video files, the file number automatically increases when a new photo file is created.
- The maximum file number allowed is the same as with video files. The photos have an SAM_####.JPG format.
- The folder names increase in this order: 100PHOTO → 101PHOTO etc.
- Up to 9,999 files can be stored in one folder. A new folder is created when more than 9,999 files have been created.

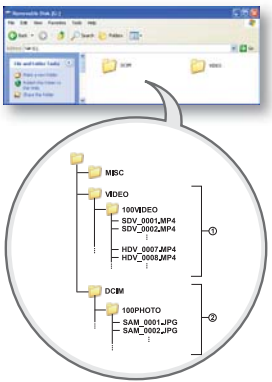

Image format

Video files

- Videos are compressed in H.264 format. The file extension is ".MP4."
- Refer to page 41 for video resolution.

Photo files

- Photos are compressed in JPEG (Joint Photographic Experts Group) format. The file extension is ".JPG."
- Refer to page 42 for photo resolution.

- When the 9,999th file is created in the 999th folder (i.e. HDV_9999.MP4 is created in the 999th VIDEO folder), no more folders can be created. Backup your files to a PC and format the storage media, then reset the file numbering from the menu.
- The name of a video file recorded by the camcorder should not be modified, since proper playback by the camcorder requires the original folder and file naming convention.

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CONNECTING TO A TV

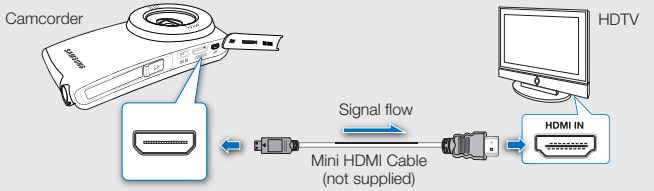
You can view the recorded videos and photos on a large screen by connecting the camcorder to an HDTV or Standard TV.

PRECHECK!

Insert a memory card. ➥page 25

Using a mini HDMI cable (not supplied)

To play back the HD-quality (1080/30p, 720/60p, or 720/30p) videos, you need an HDTV (high definition TV).



1. Turn on the camcorder, and then connect a mini HDMI cable (not supplied) from the camcorder to the HDMI In jack on your TV.
2. Turn on your TV and set the TV's input selector to the Input your camcorder is connected to.
   - Refer to the TV's instruction manual to see how to select the TV input.
3. Select the playback mode on your camcorder and start to play back videos. ➥page 36

Understanding the HDMI cable

HDMI (High Definition Multimedia Interface) is a compact audio/video interface for transmitting uncompressed digital data.

What is Anynet+?

If you have connected the camcorder using an HDMI cable to a Samsung TV that supports Anynet+, you can control the camcorder with the TV's remote control. For more information, refer to the TV's user manual.

- You can use only a C to A type mini HDMI cable with this camcorder.
- The HDMI jack on the camcorder provides output only.
- Use only HDMI 1.3 cable when connecting to the HDMI jack of this camcorder. If you connect using HDMI cable that is not version 1.3 compatible, the screen display may not work.
- Do not use excessive force when connecting the cables.
- We recommend that you use the AC power adaptor as the power source for the camcorder when you connect it to a TV.
- When the camcorder is connected to a TV, you cannot control the volume of the TV from the camcorder.
- When "**TV Display**" is set to "**Off**," the OSD (On-Screen-Display) does not appear on the TV screen. ➥page 57

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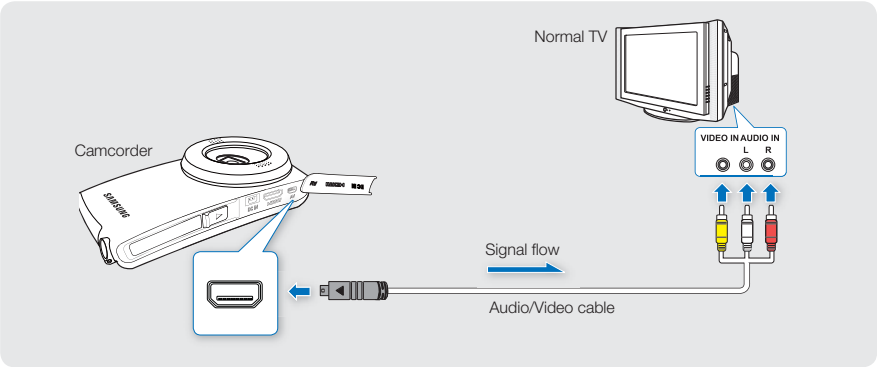
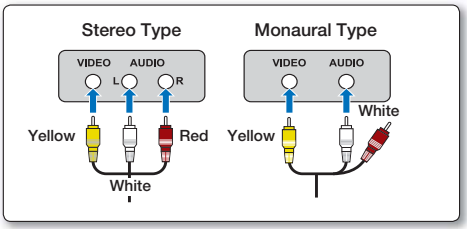
Using the Audio/Video cable (composite connection)

Use the composite connection and cables when connecting your camcorder to a standard definition (SD), analog TV or when you want to down convert HD quality video to SD quality video for playback. The composite connection automatically down converts HD quality videos (1080/30p, 720/60p, or 720/30p) to SD quality videos (480/60p).



1. Connect the provided Audio/Video cable from the camcorder to the composite video jack, and the left and right audio jacks on you TV. See the diagrams above and below.
2. Turn on your TV and set the TV's input selector to the Input your camcorder is connected to.
   - Refer to the TV's instruction manual to see how to select the TV input.
3. Select the playback mode on your camcorder and start to play back videos. ➥page 36



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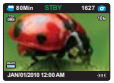
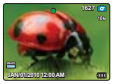
- Check the connection status between the camcorder and TV. The TV screen may not display the right video information if the camcorder and TV are connected incorrectly.
- When connecting the Audio/Video, make sure to match the color of the cable plugs to the TV jacks.
- We recommend that you use the AC power adaptor as a power source for the camcorder.
- When "**TV Display**" is set to "**Off**," the OSD (On-Screen-Display) does not appear on the TV screen. ➥ page 57

TV AND LCD MONITOR IMAGE DISPLAYS

Image appearance depends on LCD or TV screen ratio

Recording ratio	Video	Photo	LCD	TV	
				16:9	4:3
Images recorded in a 16:9 ratio					
Images recorded in a 4:3 ratio					

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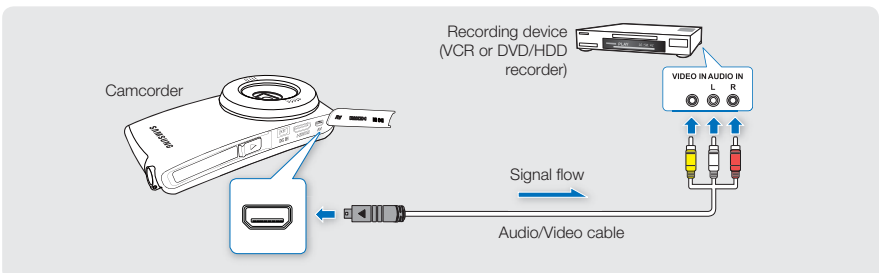
RECORDING (DUBBING) IMAGES ON A VCR OR DVD/HDD RECORDER

You can record (dub) images played back on this camcorder onto other video devices, such as VCRs or DVD/HDD recorders.

PRECHECK!

- Insert a memory card. ➥page 25
- Select the play mode by pressing the **Play** (▶) button. ➥page 20



1. Connect your camcorder to the recording device (VCR or DVD/HDD recorder) with the supplied Audio/Video cable (composite connection).
2. Turn on your recording device and set the recording device's input selector (if any) to the Input your camcorder is connected to.
3. Start the playback on your camcorder, and record it on the recording device.
   - Refer to the instruction manual of your recording device for recording directions.
4. When dubbing is finished, stop the recording device, and then your camcorder.

- Use the AC adaptor to power the camcorder to prevent the camcorder from shutting off because of a low or exhausted battery during dubbing.
- When connecting the Audio/Video cable, make sure to match the color of the cable plugs to the recording device jacks.
- Set "**TV Display**" to "**Off**" to avoid copying the OSD (On-Screen-Display) from the camcorder. ➥page 57

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Before contacting a Samsung authorized service center, perform the following simple checks. They may save you the time and expense of an unnecessary call.

WARNING INDICATORS AND MESSAGES

Power source

Message	Icon	Informs that...	Action
Low Battery	-	The battery is almost discharged.	• Charge the battery or use the AC power adaptor.
Check the authenticity of this battery	-	The battery can not pass authenticity check.	• Check whether the battery is authentic. Change to an authentic battery. • We recommended you use only genuine Samsung batteries in this camcorder.

Storage media

Message	Icon	Informs that ...	Action
Insert Card		There is no memory card inserted in the card slot.	• Insert a memory card.
Card Full		There is not enough space to record on the memory card.	• Delete unnecessary files on the memory card. • Back-up files to your PC or another storage media and delete files. • Change to another memory card which has enough free space.
Card Error		The memory card has a problem and the camcorder can't recognize it.	• Format the memory card or replace it with a new one.
Card Locked		The write protection tab on an SDHC/SD card has been set to lock.	• Release the write protection tab.
Not Supported Card		The memory card is not supported by this camcorder.	• Change to a memory card that we recommended.
Not Formatted		The memory card is not formatted.	• Format the memory card using the menu.
Not Supported Format		The memory card was formatted by another device and may still have images on it.	• The camcorder cannot play the files because it does not support the memory card's file format. Format the card using the camcorder or install and format a new card.
Low speed card. Please record at a lower resolution.	-	The memory card does not have enough speed to record.	• Change the memory card to a faster one. ➥page 27 • Change to a lower resolution.

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Recording

Message	Icon	Informs that ...	Action
Write Error	-	Problems occured while writing data to the storage media.	• Back up important files on the storage media to your PC, and then format the storage media using the camcorder.
The Number of video files is full. Cannot record video.	-	Folder and files have reached capacity and you can not record.	• Back up important files on the storage media to your PC, and then format the storage media using the camcorder. Set "**File No.**" to "**Reset**."
The Number of photo files is full. Cannot take photo.	-	Folder and files have reached their capacity and you cannot take a picture.	• Back up important files on the storage media to your PC, and then format the storage media using the camcorder. Set "**File No.**" to "**Reset**."

Playback

Message	Icon	Informs that ...	Action
Read Error	-	Problems occurred during data read from storage media.	• Back up important files on the storage media to your PC, and then format the storage media using the camcorder.

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SYMPTOMS AND SOLUTIONS

If these instructions do not solve your problem, contact your nearest Samsung authorized service center.

Power

Symptom	Explanation/Solution
The camcorder does not turn on.	• Charge the battery. • If you use an AC power adaptor, make sure it is properly connected to the wall outlet. • Unplug the AC power adaptor, and reconnect the power supply to the camcorder before turning it on.
The power automatically turns off.	• Is "**Auto Power Off**" set to "**5 Min**"? If no button is pressed for about 5 minutes, the camcorder automatically turns off. To disable this option, change the setting of "**Auto Power Off**" to "**Off**." ➥page 56 • The battery is almost discharged. Charge the battery. • Use the AC power adaptor.
Power cannot be turned off .	• Unplug the AC power adaptor, and then reconnect the power supply to the camcorder before turning it on.
The battery discharges quickly.	• The temperature is too low. • The battery is not fully charged. Recharge the battery. • The battery reached the end of its lifespan and cannot be recharged. Contact your nearest Samsung authorized service center.

Display

Symptom	Explanation/Solution
The recorded image is wider or narrower than the original image.	• You should check the resolution before you record. ➥pages 41, 42
Unknown indicator appears on the screen.	• A warning indicator or message appears on the screen. ➥pages 72, 73
An after image remains on the LCD screen.	• This occurs if you disconnect the AC power adaptor before turning the power off.
The image on the LCD screen looks dark.	• Ambient light is too bright. Adjust the brightness and angle of the LCD.

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Storage Media

Symptom	Explanation/Solution
Memory card functions are not operable.	• Insert a memory card into your camcorder properly. ➥page 26 • If you are using a memory card formatted on a computer, format it again directly on your camcorder. ➥page 52
Image cannot be deleted.	• Release the lock on the write-protect tab of the memory card (SDHC/SD memory card), if any. ➥page 26 • You cannot delete protected images. Remove protection from the image. ➥page 47
You cannot format the memory card.	• Release the lock on the write-protect tab of the memory card (SDHC memory card, etc.), if any. ➥page 26 • Copy all important recorded files to your PC before formatting. Samsung is not responsible for any loss of data. (We recommend that you copy the data to your PC or other storage media.)
The data file name is not indicated correctly.	• The file may be corrupted. • The file format is not supported by your camcorder. • The camcorder only displays the file name if the directory structure does not comply with the international standard.

Recording

Symptom	Explanation/Solution
Pressing the **Recording start/stop** (●) button does not start recording.	• There is not enough free space to record on the storage media. • Make sure the memory card is inserted and write-protect tab is set to unlock. • The internal temperature of your camcorder is unusually high. Turn off your camcorder and leave it for a while in a cool place. • Your camcorder is damp and moist inside (condensation). Turn off your camcorder and leave it for about 1 hour in a cool place.
The actual recording time is less than the estimated time.	• The estimated recording time may vary depending on contents and features used. • Recording a fast-moving subject increases the bit rate and consequently the amount of storage space required for the recording, which can lead to a shorter available recording time.

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Recording

Symptom	Explanation/Solution
The recording stops automatically.	• There is no more free space for recording on the storage media. Back up important files on your PC and format the storage media or delete unnecessary files. • If you use a memory card with a low writing speed, the camcorder automatically stops recording videos and the corresponding message appears on the LCD screen.
When recording a subject illuminated by bright light, vertical lines appear.	• The camcorder is unable to record these levels of brightness.
When the screen is exposed to direct sunlight during recording, the screen turns red or black for an instant.	• Do not leave the camcorder with the LCD screen exposed to direct sunlight.
The beep sound is not heard.	• Set the "**Beep Sound**" to "**On**." ➥page 55 • The beep sound is temporally off while recording videos. • When the Audio/Video cable is connected to the camcorder, the beep sound automatically turns off.
There is a time difference between the point where you press **Recording start/stop** ( ) button and the point where the recorded video starts/stops.	• On your camcorder, there may be a slight time delay between the point when you press **Recording start/stop** ( ) button and the actual point where the recorded video starts/stops. This is not an error.
You cannot record a photo	• Set your camcorder to Record mode. ➥page 20 • Release the lock on the write-protection tab of the memory card if set. • The storage media is full. Use a new memory card or format the storage media. ➥page 52 Or delete unnecessary images. ➥page 46

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Adjusting the image during recording

Symptom	Explanation/Solution
It is out of focus.	• This camcorder has no user-adjustable focus control function. • The minimum focal length between the camcorder and the subject is 20cm (about 7.87 inches) for wide angle and 80cm (about 31.50 inches) for telephoto.

Playback on your camcorder

Symptom	Explanation/Solution
Playback (play/pause) function does not work.	• Press the **Play** (▶) button to set the Play mode. • Image files recorded on another camcorder may not play on your camcorder. • Check out the memory card compatibility. ➥page 26
The skip or search function does not work properly.	• If the temperature inside the camcorder is too high, it cannot function properly. Turn the camcorder off, wait for a few moments, and turn it on again.
Playback is interrupted unexpectedly.	• Check if the AC power adaptor is properly connected and stable.
You cannot hear sound when playing a Time Lapse recording.	• The Time Lapse REC function does not support sound.

Playback on other devices (TV, etc.)

Symptom	Explanation/Solution
You cannot view the image or hear the sound on the connected device.	• The Audio/Video cable is not connected properly. ➥page 69
The image appears distorted on TV or PC player.	• The display mode of the recorded video does not match that of playback device. • A video recorded in 16:9 wide mode should be played back on a TV or PC that supports 16:9 screen mode.

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Connecting to a computer

Symptom	Explanation/Solution
Your computer does not recognize your camcorder.	• Disconnect the built-in USB plug of the camcorder from the PC, restart the PC, and then reconnect camcorder correctly.
Cannot play a video file properly on a PC.	• A video codec is needed to play the file recorded on your camcorder. Install or run the built-in edit software (Intelli-studio). • Check whether the built-in USB plug of the camcorder is connected in the proper direction. • Disconnect the built-in USB plug of the camcorder from the PC, restart the computer, and then reconnect the camcorder properly. • Your computer may not have the necessary performance specifications to play back a video file. Check the recommended computer specifications.
Intelli-studio does not function properly.	• Exit the Intelli-studio application, and restart the Windows computer. • Intelli-studio is not Macintosh compliant. • Set **"PC Software"** to **"On"** in the Settings menu. • The Intelli-studio program may not run automatically. If this occurs, access My Computer or Windows Explorer, open the drive that corresponds to your camcorder, find Intelli-studio, and then run IStudio.exe.
The image or sound on your camcorder is not played on your computer properly.	• Video playback or sound may stop temporarily depending on your computer. The video or sound copied to your computer is not affected. • If your camcorder is connected to a computer that does not support Hi-speed USB (USB2.0), the images or sound may not be played back correctly. The images and sound copied to your computer are not affected.
The playback screen is paused or distorted.	• Check the system requirements to play a video. ➥page 59 • Exit all other applications running on the computer. • The transfer speed between the camcorder and PC is too slow, causing the video to pause or distort. Please copy the file to your PC, and then play it back.

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Connecting/Dubbing with other devices (TV, DVD recorder, etc.)

Symptom	Explanation/Solution
You cannot dub correctly using the Audio/Video cable.	• The Audio/Video cable is not connected properly. Make sure that the Audio/Video cable is connected to the proper jack, i.e. to the input jack of the device used for dubbing images from your camcorder. ➥page 71

General operations

Symptom	Explanation/Solution
The date and time are incorrect.	• Has the camcorder been left unused for a long period of time? The backup built-in rechargeable battery may be discharged. ➥page 16

Menu

Symptom	Explanation/Solution
Menu items are grayed out	• You cannot select grayed items in the current recording/playback mode. • If there is no storage media inserted, it cannot be selected and will be dimmed on the menu : "**Storage Info**", "**Format**", etc.

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MAINTENANCE

The suggestions below will help you fulfill any warranty obligations and allow you to enjoy this product for many years.

Cautions when storing

- For safekeeping of the camcorder, turn off the camcorder.
  - Remove the battery and AC power adaptor.
  - Remove the memory card.

Cleaning the camcorder

Before cleaning, turn off the camcorder and remove the battery and AC power adaptor.

- **To clean the exterior**
  - Wipe gently with a soft dry cloth. Do not apply excessive force when cleaning. Gently rub the surface.
  - Do not use benzene or thinner to clean the camcorder. The exterior coating could peel off or the case could deteriorate.
- **To clean the LCD screen**
  Wipe very gently with a soft dry cloth. Be careful not to damage the screen.
- **To clean the lens**
  Use a blower brush to remove dust and wipe the lens gently with a soft dry cloth.
  If necessary, wipe gently with lens paper or tissue.
  - Mold may form if the lens is left dirty.
  - If the lens looks dim, turn off the camcorder and leave it off for about 1 hour.

LCD screen

- **To prolong its service life, do not rub the LCD screen with a coarse cloth.**
- **Be aware of the following LCD screen phenomena. They are not malfunctions.**
  - When you use the camcorder, the surface around the LCD screen may heat up.
  - If you leave the power on for a long time, the surface around the LCD screen becomes hot.
  - When using the camcorder in cold conditions, an afterimage may appear on the LCD screen.
- An LCD screen is manufactured using advanced technology which creates screens with pixel failure rates of less than 0.01%. However, a black or bright spot (red, blue, white) may appear in the center of the LCD screen and up to two spots may appear outside the center. These spots, which are normally incurred during the manufacturing process, do not affect the recorded images.

When there is dew condensation, put the camcorder aside for a while before using

- What is dew condensation?
  Dew condensation happens when a camcorder is moved to a location where there is a significant temperature difference from the previous location. The dew condenses on the external or internal parts of the camcorder, and on the reflection lens. If there is dew on or in your camcorder, it may cause the camcorder to malfunction or damage the camcorder when you turn the power on.
- Exactly when does dew condensation occur?
  When you move the camera to a location with a higher temperature than the previous location, or when you move it to a hot area suddenly. Examples:
  - You record outside in cold weather during the winter and then move the camera in indoors.
  - You record outside in hot weather after being indoors or inside a car where the A/C was running.
- What can I do?
  - Turn the power off, detach the battery, and leave the camcorder in a dry area for 1~2 hours before using it.

- Use the camcorder only after dew condensation has completely disappeared.
- Be sure to use the recommended accessories supplied with the camcorder. For service, contact your nearest Samsung authorized service center.

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USING YOUR CAMCORDER ABROAD

- Each country or region has its own electric and color systems.
- Before using your camcorder abroad, check the following items.

Power sources

The provided AC adaptor lets you power and use your camcorder in any country/region that has AC power in the 100 V to 240 V, 50/60 Hz range. You may need a commercially available AC plug adaptor depending on the design of local wall outlets.

On TV color systems

Your camcorder is an **NTSC**-system-based camcorder.
If you want to view your recordings on a TV or to copy it to an external device, it must be an **NTSC**-system-based TV or external device and have the appropriate Audio/Video jacks. Otherwise, you may need to use a separate video format transcoder (NTSC-PAL format converter).

The format transcoder is not provided by Samsung.

NTSC-compatible countries/regions

Bahamas, Canada, Central America, Japan, Korea, Mexico, Philippines, Taiwan, United States of America, etc.

PAL-compatible countries/regions

Australia, Austria, Belgium, Bulgaria, China, CIS, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Great Britain, Holland, Hong Kong, Hungary, India, Iran, Iraq, Kuwait, Libya, Malaysia, Mauritius, Norway, Romania, Saudi Arabia, Singapore, Slovak Republic, Spain, Sweden, Switzerland, Syria, Thailand, Tunisia, etc.

You can make recordings with your camcorder and view pictures on the LCD screen from anywhere in the world.

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specifications

Model name	HMX-U20BN/HMX-U20RN/HMX-U20LN/HMX-U20SN

System	Video signal	NTSC
	Picture compression format	H.264 (MPEG-4.AVC)
	Audio compression format	AAC (Advanced Audio Coding)
	Image device	1/2.3", CMOS (Complementary Metal-Oxide Semiconductor)
	Lens	F3.5 ~ F6.8, Optical zoom: x3 (Photo only), Intelli-zoom: x3.6 (Video only)
	Focal length	5.1mm~15.3mm
LCD screen	Size/dot number	2 inch / 154k
	LCD screen method	TFT LCD
Connectors	Composite output	1Vp-p (75 Ω terminated)
	HDMI output	C type connector
	Audio output	-7.5 dBs (600 Ω terminated)
	USB output	Built-in USB
General	Power source	5.0V (using AC power adaptor), 3.7V (using built-in lithium Ion battery)
	Power source type	Lithium Ion battery, Power supply (100 V ~ 240 V) 50/60 Hz
	Power consumption (Recording)	2.4W
	Operating temperature	32℉~104℉ (0℃~40℃)
	Operating humidity	Below 60%
	Storage temperature	-4℉ ~ 140℉ (-20℃ ~ 60℃)
	Dimensions (WxHxD)	2.07" x 4.09" x 0.61" (52.5 mm x 104 mm x 15.6 mm)
	Weight	0.23 lb (103.3g, 3.64 oz) (Except for Lithium Ion battery)
	Internal MIC	Omni-directional stereo microphone
	Storage media	Memory card (SD/SDHC)

※ These technical specifications and design may be changed without notice.

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SAMSUNG
LIMITED WARRANTY

SAMSUNG Electronics America Inc. (SEA), warrants that this product is free from defective material and workmanship.
SEA further warrants that if product fails to operate properly within the specified warranty period and the failure is due to improper workmanship or defective material, SEA will repair or replace the product at it's option.
All warranty repairs must be performed by a SEA authorized service center. The name and address of the location nearest you can be obtained by calling toll free: 1-800 SAMSUNG (1-800-726-7864).
Labor
90 days carry-in
Parts
1 year

On carry-in models, transportation to and from the service center is the customer's responsibility.

The original dated sales receipt must be retained by the customer and is the only acceptable proof of purchase.
It must be presented to the authorized service center.

EXCLUSIONS (WHAT IS NOT COVERED)

This warranty does not cover damage due to accident, fire, flood and/or other acts of God; misuse, incorrect line voltage, improper installation, improper or unauthorized repairs, commercial use, or damage that occurs in shipping.
Exterior and interior finish, lamps, and glass are not covered under this warranty.
Customer adjustments which are explained in the instruction manual are not covered under the terms of this warranty.
This warranty will automatically be voided for any unit found with a missing or altered serial number. This warranty is valid only on products purchased in the United States and Puerto Rico.
Some States do not allow the exclusions or limitations of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you.
This warranty gives you specific legal rights, and you may also have other rights which vary from State to State.

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COUNTRY	CALL	OR VISIT US ONLINE AT	WRITE
IN THE US	1-800-SAMSUNG (726-7864)	www.samsung.com	Samsung Electronics America, Inc. 85 Challenger Road Ridgefield Park, NJ 07660-2112

RoHS compliant

Our product complies with “The Restriction Of the use of certain Hazardous Substances in electrical and electronic equipment”, and we do not use the 6 hazardous materials- Cadmium(Cd), Lead (Pb), Mercury (Hg), Hexavalent Chromium (Cr +6), Poly Brominated Biphenyls (PBBs), Poly Brominated Diphenyl Ethers(PBDEs)- in our products.

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